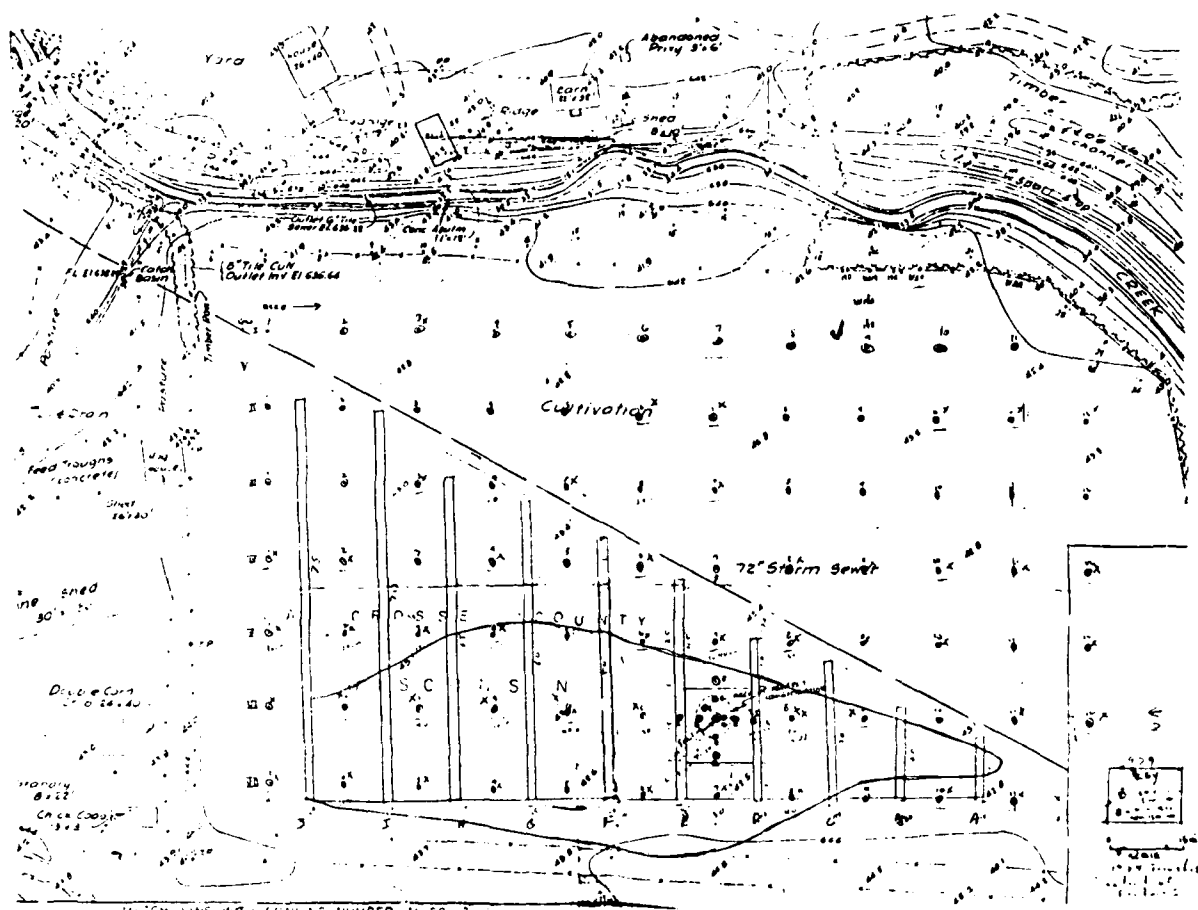


A CULTURAL RESOURCES EVALUATION OF  
THE PAMMEL CREEK SITE (47Lc61):  
An Oneota Occupation at La Crosse, Wisconsin



REPORTS OF INVESTIGATIONS NUMBER 19  
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A CULTURAL RESOURCES EVALUATION OF  
THE PAMMEL CREEK SITE (47LC61):

AN ONEOTA OCCUPATION AT LA CROSSE, WISCONSIN

BY

ROBERT F. BOSZHARDT  
JAMES L. THELER  
AND  
JAMES P. GALLAGHER

PRINCIPAL INVESTIGATOR: JAMES P. GALLAGHER

REPORTS OF INVESTIGATIONS NUMBER 19  
MISSISSIPPI VALLEY ARCHAEOLOGY CENTER  
AT  
THE UNIVERSITY OF WISCONSIN-LA CROSSE

FINAL REPORT SUBMITTED IN PARTIAL FULFILLMENT OF  
CONTRACT DACW-37-83-M-1095  
FOR THE  
ST. PAUL DISTRICT, U.S. ARMY CORPS OF ENGINEERS

MAY 1984

# ABSTRACT

Phase II archaeological investigations were undertaken at the Pammel Creek Site (47Lc61) in La Crosse County, Wisconsin. The study was conducted by the Mississippi Valley Archaeology Center in 1983 under contract to the the St. Paul District, U.S. Army Corps of Engineers. These investigations determined that the site is far more extensive than previously thought, and includes a probable single-component Oneota habitation site that appears to meet eligibility criteria for the National Register of Historic Places. The ceramic assemblage suggests that the site cannot be assigned to either the Blue Earth or the Orr Phase, although some similarities to each do occur. Analysis of well preserved floral and faunal remains revealed a mixed economy which emphasized corn agriculture and wetland resources exploitation. In addition, procurement of bison scapula hoes is indicated, and the lithic raw materials suggest connections to the south. Radiocarbon assays from the site cluster in the 15th Century A.D.

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## MANAGEMENT SUMMARY

In April of 1983, the Mississippi Valley Archaeology Center entered into contractual agreement with the St. Paul District Corps of Engineers to perform Phase II archaeological testing and evaluation of the Pammel Creek Site (47Lc61), an Oneota village at the south end of the City of La Crosse, Wisconsin. The site is situated in a small park at the mouth of Pammel Creek, where construction of a sedimentation basin is planned as part of the State Road Coulee flood control project. This project is being administered jointly by the St. Paul District and the City of La Crosse. This cultural resources investigation also included a Phase I resurvey of a small tract of land along Pammel Creek at the mouth of State Road Coulee. A report describing that survey has already been submitted to the St. Paul District (Boszhardt and Gallagher 1984).

The plans for the sedimentation basin include development of the eastern half of the park by the City in the near future. The Corps of Engineers is to enlarge the basin at a later date, and had intended on doing so in the western half of the park.

The Pammel Creek Site was located during a 1980 shovel test survey, part of the Phase I cultural resources investigations of the State Road Coulee flood Control project (Hays et al. 1981). During that survey, prehistoric materials were recovered throughout much of the park, though the majority came from the western portion. In addition, apparent in situ Oneota remains were detected in a 50 m<sup>2</sup> area within the western half of the park.

The purpose of the Phase II study was to evaluate the eligibility of the Pammel Creek site for the National Register of Historic Places, in compliance with federal legislative acts which protect cultural resources. Initially, the scope of work called for test excavations within the 50 m<sup>2</sup> area where the apparent in situ remains had been located. Investigation of adjacent areas also was required to ensure that other potentially significant resources were not overlooked.

Field work was conducted from May 16 to June 3, 1983. The investigation strategy consisted of excavating 10 backhoe trenches across the western portion of the park, and stripping a 15 x 15 m area centered the location of the apparent in situ remains identified during the Phase I survey. These excavations revealed immediately that the site was far more extensive than had been anticipated. A total of 82 possible features were identified in the exposed areas. These were distributed over nearly 5,400 m<sup>2</sup> area, primarily in the west half of the park. At that time, the scope of the Phase II investigations was reevaluated.

The St. Paul District and the Historic Preservation Division (SHSW) agreed that the site was likely to be eligible for the National Register of Historic Places. Consequently, Phase II testing to evaluate the significance of the site was deemed unnecessary. However, the existing construction schedule made mitigation work necessary.

The Mississippi Valley Archaeology Center was asked to submit a mitigation plan including a research design and budget. The St. Paul District then

weighed this plan and the alternative of site preservation, and decided to implement a preservation strategy.

At the time of that decision, 49 of the 82 possible features had been partially excavated. These included a variety of refuse/storage pits and general midden concentrations. Preservation was good, and large quantities of floral and faunal remains were recovered, in addition to lithics and ceramics. Identifiable floral remains were recovered through flotation of matrix samples. These remains were sent to Leonard Blake of Washington University in St. Louis for identification. Faunal materials were sent to James L. Theler for identification. The results of both of these analyses are incorporated into the following report. Ceramic and lithic artifacts were washed, sorted, catalogued, and analyzed at the Mississippi Valley Archaeology Center laboratory. All of the recovered materials are presently curated at the Mississippi Valley Archaeology Center.

Following the contractual investigations at the Pammel Creek Site, the Mississippi Valley Archaeology Center also conducted two public field schools at the site. These consisted of sample excavations of additional features. Only preliminary analysis of the materials recovered during the field schools has been completed; however, this information has added greatly to the understanding of the site and its significance. Some of the results of these investigations are mentioned in the report.

The Pammel Creek Site was the location of intensive Oneota activity. The site contains well preserved organic remains and artifacts, which indicates a wide range of activities, in numerous pit features and in a partially undisturbed midden near the surface. Only a small proportion of the site area has been investigated, and most of the excavated features were only sampled. Four radiocarbon dates have been obtained from the site, dating it to ca. A.D. 1400 - 1500. These dates correspond to those from four of the other five dated Oneota sites on the La Crosse terrace system.

The Pammel Creek site is one of three large Oneota occupations at the south end of the La Crosse terrace. The other two, the Overhead (47Lc20) and Jim Braun (47Lc59) sites, have been severely disturbed in recent years. Therefore, the Pammel Creek site is the only known intact Oneota site at the south end of the La Crosse terrace system, making its preservation especially important.

## INTRODUCTION

This report describes limited Phase II archaeological investigations at the Pammel Creek Site (47Lc61) at the south end of the City of La Crosse, Wisconsin. The study was sponsored by the St. Paul District Corps of Engineers in compliance with federal cultural resources legislation. The work was conducted by the Mississippi Valley Archaeology Center. Dr. James P. Gallagher acted as Principal Investigator, and Robert F. Boszhardt served as field director and supervised laboratory analysis, with the able assistance of Bridget Mullen.

The Pammel Creek Site is in the project area for proposed construction of a settling basin, part of the State Road Coulee flood control project. This project is being administered jointly by the St. Paul District and the

City of La Crosse. Its purpose is to alleviate flooding problems in the drainages of Ebner and State Road Coulee. These drainages have been historically modified to merge as Pammel Creek, which meets the Mississippi River floodplain just downstream from the Pammel Creek Site.

The Pammel Creek Site is located in a small park W1/2, NW1/4, SW1/4, Sec. 22, T15N, R7W (Figure 1). At present the park is bounded by the artificial channel of Pammel Creek on the east and south, and by a terrace rise, now occupied by the Sherwood Heights residential subdivision, to the west and north (Figure 2).

This location is near the southern limit of the extensive Pleistocene terraces that begin 30 km to the north, where the Mississippi trench widens, and upon which the City of La Crosse is built.

The site is one of three known Oneota habitation sites at the south end of the City. The Overhead Site (47Lc20) is located immediately across Pammel Creek to the southeast, and the Jim Braun Site (47Lc59) is located 2.5 km to the northwest. Each of these sites is situated on the edge of the dry terraces, overlooking the wet Mississippi River floodplain. The Overhead and Jim Braun sites have been severely disturbed in recent years, leaving the Pammel Creek site as the only known Oneota site with well preserved cultural deposits at the south end of La Crosse. Numerous Oneota sites are recorded several miles to the north of the La Crosse River Valley. Thus, the apparent cluster of Oneota sites at the south end of the La Crosse terrace present an interesting case for studying Oneota settlement patterns and cultural relationships.

The goals of this project, as stated in the scope of work, were to identify the extent of the site, and to determine whether significant remains occurred, in order to evaluate the eligibility of the site for the National Register of Historic Places. The excavations at the Pammel Creek Site were begun on May 16 and lasted until June 3, 1983, involving a total of 672 field man-hours. The site was sampled by removing the plow zone in ten trenches with a backhoe, and stripping a 15 x 15 meter area over the location of apparently in situ cultural deposits located during a 1980 Phase I shovel test survey.

The initial excavations clearly revealed that the site contains significant cultural resources, and is much larger than had been anticipated. During the mechanical stripping of the site, numerous refuse and storage pits, as well as in situ midden deposits, were encountered. These extended over an area of at least 5400 square meters. Thus, the stated goals of determining the sites eligibility for the National Register of Historic Places was quickly realized. This report will form the basis for a nomination of the site to the National Register, and will hopefully benefit others interested in studying the Prehistoric Oneota Culture.

Due to the unexpected abundance of undisturbed cultural remains, only a portion of the features were excavated, most of which were sampled with cross-section trenches. Thus, the majority of the cultural materials remain intact, and will permit future investigations at the site.

Artifact processing was concurrent with the field investigations, and analysis continued until late summer. Further analysis, interpretation, and



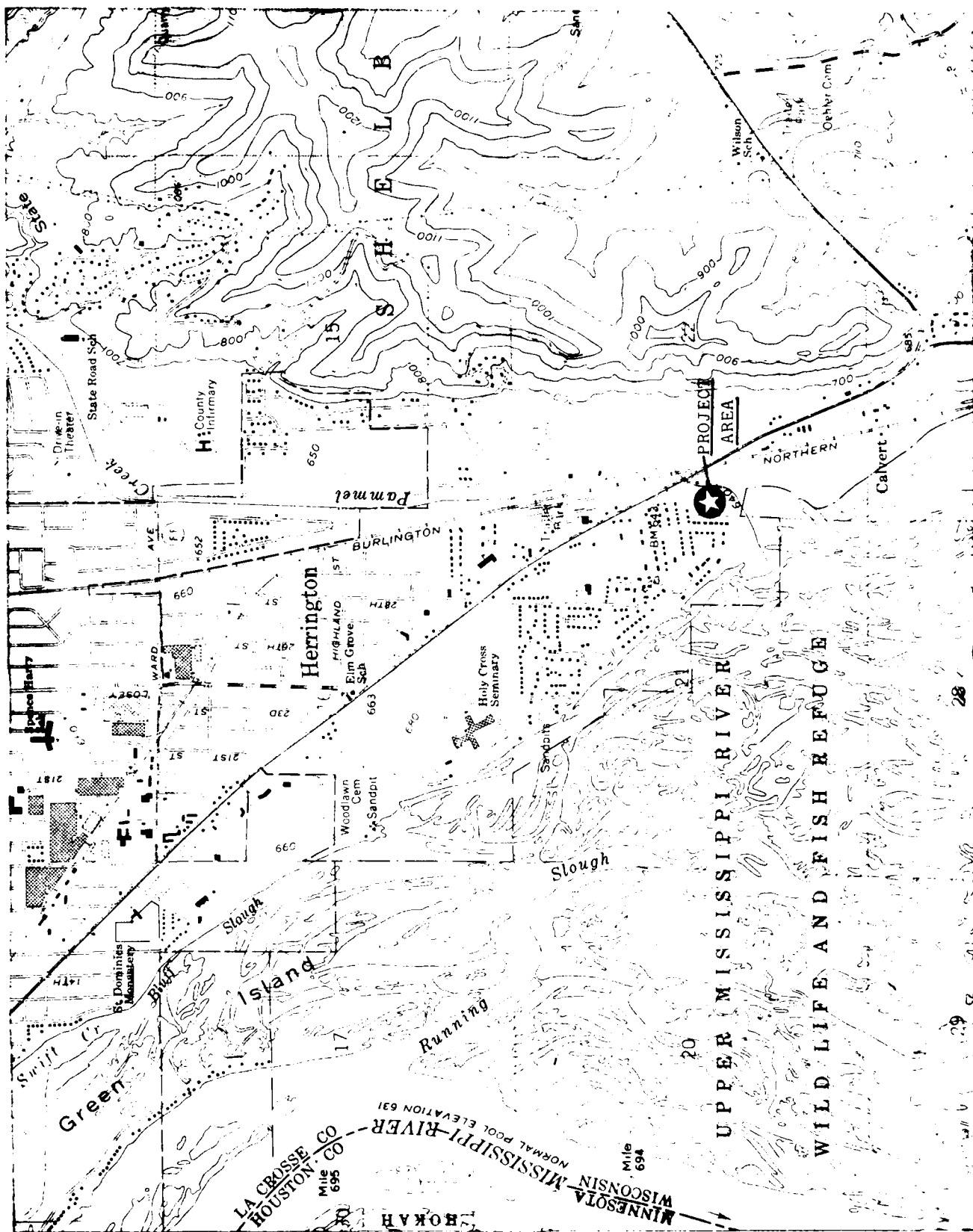


Figure 1. Location of project area (1974 U.S.G.S La Crosse 7.5 Quad)

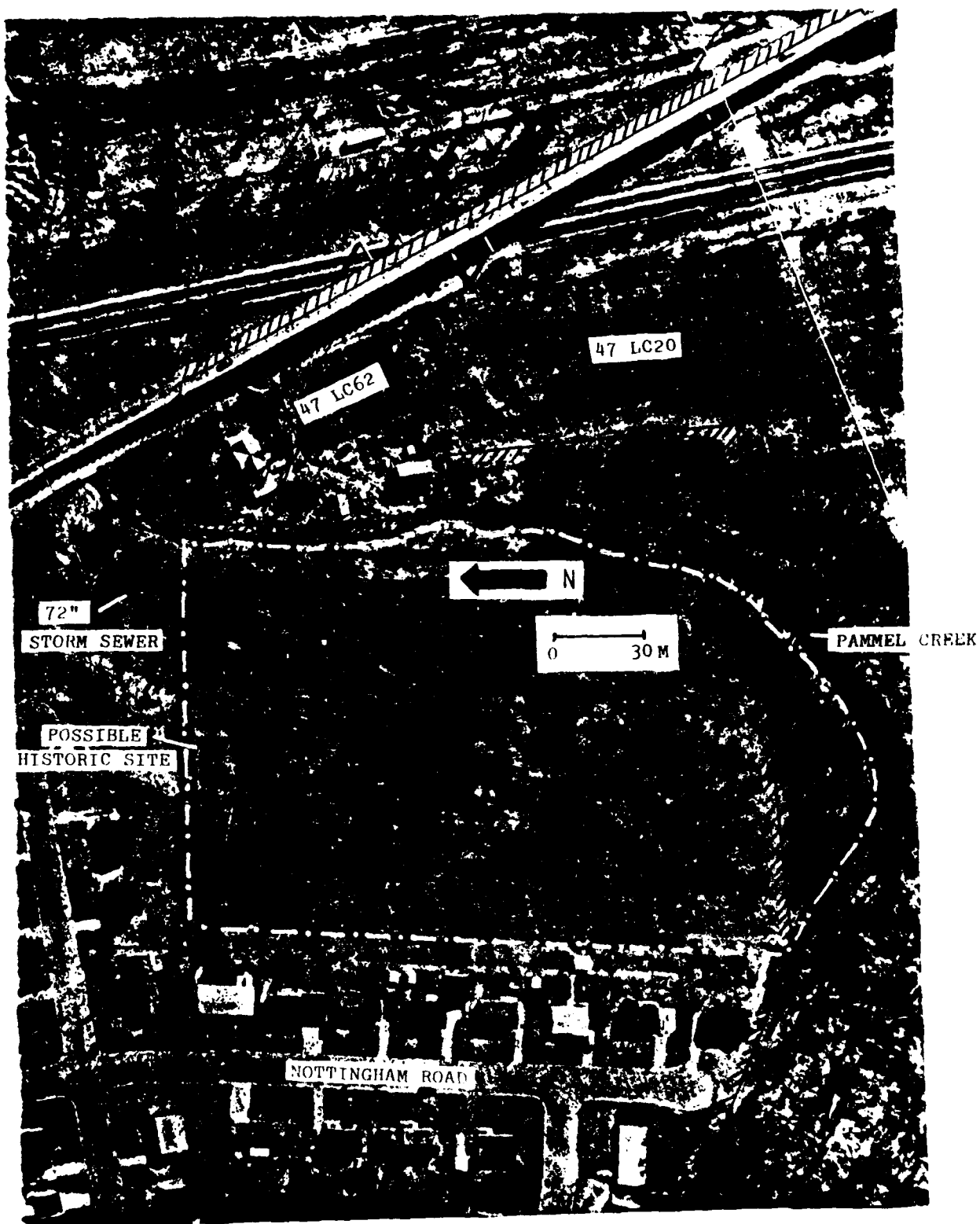


Figure 2: Aerial photograph of project area (outlined in white).

report preparation were undertaken throughout the fall and into January of 1984. This work required approximately 1500 man-hours beyond the field labor. All artifacts and field and laboratory records are housed at the Mississippi Valley Archaeology Center at the University of Wisconsin-La Crosse.

This report will follow the outline provided in the scope of work. A management summary precedes this introduction. The site environs are described in the following section, which includes current interpretations of Oneota economic strategies and their relationship to the local environmental settings. Archaeological studies in the area are described in the previous investigations section, demonstrating the importance of the Pammel Creek site for future studies of the La Crosse area Oneota. The field and laboratory procedures are explained in a methodology section, which precedes the results of the study. The results are presented in sub-sections including site areal extent, site history, stratigraphy, features, and artifact analysis, in which lithic, ceramic, faunal, and floral remains are discussed. Much of the raw data are presented in tabular form, accompanied by illustrations. Finally, a summary section is provided which includes an interpretive overview, and advocates preservation of the remaining portion of the site. In this section, some information is presented on subsequent excavations at the site in 1983 by the Mississippi Valley Archaeology Center and the University of Wisconsin-La Crosse. All citations mentioned in the report are listed in the references cited, and attached appendices include vitas, the scope of work, relevant correspondence, and field notes, and a mitigation plan.

## ENVIRONMENTAL SETTING

The project area is located within the Western Uplands geographical province of Wisconsin (Martin 1965). This province encompasses much of the well known Driftless Area, a region that lacks direct evidence of Pleistocene glaciation (Mikelson, Knox, and Clayton 1982). The lack of glacial action is reflected in mature dendritic drainage systems that have deeply dissected the local bedrock formations. Three distinctive physiographic zones are present in the immediate vicinity of the project area: the dissected uplands, the Pleistocene terraces, and the lowland floodplain of the Mississippi River.

### Physiography

The local uplands consist of Ordovician dolomitic bedrock overlying Cambrian sandstones. These formations are capped with a mantle of aeolian loess. These deeply dissected uplands are characterized by narrow rounded ridges that have resisted weathering, and steep-sided valleys forming dendritic drainage patterns. The permeable bedrock acts as an aquifer, releasing groundwater through numerous springs. The bedrock formations also contain chert nodules and silicified sandstone deposits which were used by prehistoric people for the manufacture of stone tools. The uplands are most pronounced along the Mississippi River trench, where several 150 m. bluffs mark the edge of the valley. One such bluff is located only 600 m. to the east of the Pammel Creek Site.

The Mississippi River Valley formed by rapid downcutting during the torrential flow of glacial meltwater. Due to the weak structure of the local Cambrian sandstone, the Mississippi Valley is unusually wide at La Crosse. As the glacial meltwaters slowed, vast quantities of sand and gravel outwash were

deposited in the valley. Later downcutting by the river into these deposits left terraces along the valley margins. Because of the excessive width of the trench at La Crosse, this portion of the Upper Mississippi Valley contains extensive terrace deposits. Many of these terraces were modified by wind action, forming sand dunes.

An interesting pattern is evident near La Crosse, where the terraces frequently dip along the base of the bluffs. The Pammel Creek Site itself is situated in a low area, with the bluffs to the east and the terrace to the west and north. Martin interpreted this bluff-base depression, which originates to the north, as an abandoned channel of the La Crosse River (1965:159). In earlier times, several small non-glacial tributaries drained into wetlands formed in these areas at the base of the bluffs. The drainage of these low areas was blocked by the large terraces between the bluffs and the Mississippi floodplain. Pammel Creek, for example, is recorded on 1847 Government Land Office Survey documents as flowing from State Road Coulee (a small non-glacial valley) into a wetland, located at the mouth of the coulee, on the east side of the Pleistocene terrace (Boszhardt and Gallagher 1983; Brown 1847). This creek later was channelized so that it now flows southward, forming the eastern and southern edges of the Pammel Creek Site, and then joining the Mississippi River just southwest of the site. However, the early records do not indicate that the creek followed this course prior to channelization.

The Mississippi floodplain is a broad corridor of low islands, marshes, ponds, lakes, sloughs, and channels. The soils of the present floodplain typically are fine silts and sands, deposited over Pleistocene outwash within the Holocene Epoch.

#### Soils

As noted earlier, the Pammel Creek Site is situated within a swale thought to represent an abandoned channel of the La Crosse River, between the bluffs and the terraces. Although wet silty soils are common within this swale, the soils at the site are classified as Dakota Sandy Loam, 0-2% slope (Beatty 1960). Dakota soils contain a dark organic A Horizon overlying dark brown (B) and lighter yellowish-brown (C) sandy horizons. The soils are acidic, and are subject to drought in dry years. The Dakota soil characteristics refer primarily to higher terrace locations; the lower elevation of the Pammel Creek Site may have made the soils at the site somewhat less droughty.

#### Vegetation and Fauna

Each of the three local physiographic zones supported distinct biotic communities prior to Euro-American alterations. Gallagher and Stevenson (1982) have utilized historic records to reconstruct the environment of the La Crosse area, and identified six economic resource zones: (1) dry uplands; (2) sandy prairie and (3) oak savanna, both located on the terraces; and (4) dry bottomlands, (5) wet bottomlands, and (6) open water, all associated with the lowland floodplains of the Mississippi, La Crosse, and Black Rivers.

The dry uplands supported a mosaic of vegetative communities, including prairie/oak savanna on the rounded upland ridge tops; mesic forests of birch, basswood, and maple on north- and east- facing slopes; and dry oak/hickory forests and cedar glades ("goat prairies") on south- and west- facing exposures. Resources associated with this zone would have included nuts, berries, and other fruits, white-tailed deer, and other large and small mammals, and birds.

The sandy prairie and savanna zones may have provided fewer food resources. However, they would have supported jackrabbit, ground squirrel, game birds, and possibly elk and bison. Furthermore, the well-drained nature of these areas, and their easy access to the floodplain would have made the terraces ideal locations for prehistoric settlements.

The dry bottomlands include areas vegetated with silver maple, river birch, cottonwood, ash, elm, and an understory of viny plants such as wild grape and poison ivy. These areas supported deer, raccoon, squirrel, and beaver. The wet bottomland zone includes wet prairies, sedge meadows, and tamarack bogs containing plant species such as willow, reeds, cattail, lotus, arrowleaf, and in places wild rice and cranberries. These areas would have supported waterfowl (abundant during migration) and riparian mammals such as beaver, muskrat, and otter. Resources exploited from open water zones would have been fish, fresh-water mussels, and waterfowl.

Although the Pammel Creek Site was not included in Gallagher and Stevenson's analysis, a catchment was reconstructed for the immediately adjacent Overhead Site (47Lc20). Due to their close proximity, the catchments for these sites should be virtually identical. Figure 3 shows the walking time site catchment of the Overhead Site. The outermost ring of this catchment represents a two-hour walk from the site. Each of the six economic resource zones would have been available within the catchment.

#### Climate

Generalized climatic reconstructions are available for the Driftless Area throughout the Holocene (Bartlein and Webb 1982; Knox, McDowell, and Johnson 1981). Local historical records offer glimpses of the La Crosse region during early Euro-American settlement, beginning in the mid-seventeenth century. However, detailed information for most of the Holocene environment of La Crosse is not available. Today, the climate of the La Crosse area is humid continental, with extreme seasonal variation in temperature. The area annually receives an average of 29.9 inches of precipitation. The average yearly temperature is 46 degrees (F.), with an average growing season of 163 days (Beatty 1960, Claflin 1973). One especially interesting phenomenon is the ameliorating climatic affect of the Mississippi trench. Records indicate that the temperatures within the trench are often several degrees warmer than upland localities of the same latitude. This effect increases the growing season within the trench by approximately 15 days (Cawley 1973).

#### PREVIOUS INVESTIGATIONS

Until the early 1970s, no archaeological sites had been reported from the south end of the La Crosse terrace. In 1971 the University of Wisconsin-Madison conducted salvage excavations at the north end of the Overhead Site (Stoltman 1973), located immediately southeast of the project area, across the modern channel of Pammel Creek. The 1971 excavations uncovered Oneota habitation remains, including pit features, hearths, and a possible structure which was identified on the basis of a post mold pattern. Two radiocarbon samples from these investigations were assayed at A.D. 1485  $\pm$  55 (WIS-601) and A.D. 1510  $\pm$  65 (WIS-573). The site was interpreted as Orr Phase Oneota, based on ceramic similarities to the type Allamakee Trailed (Wedel 1959).

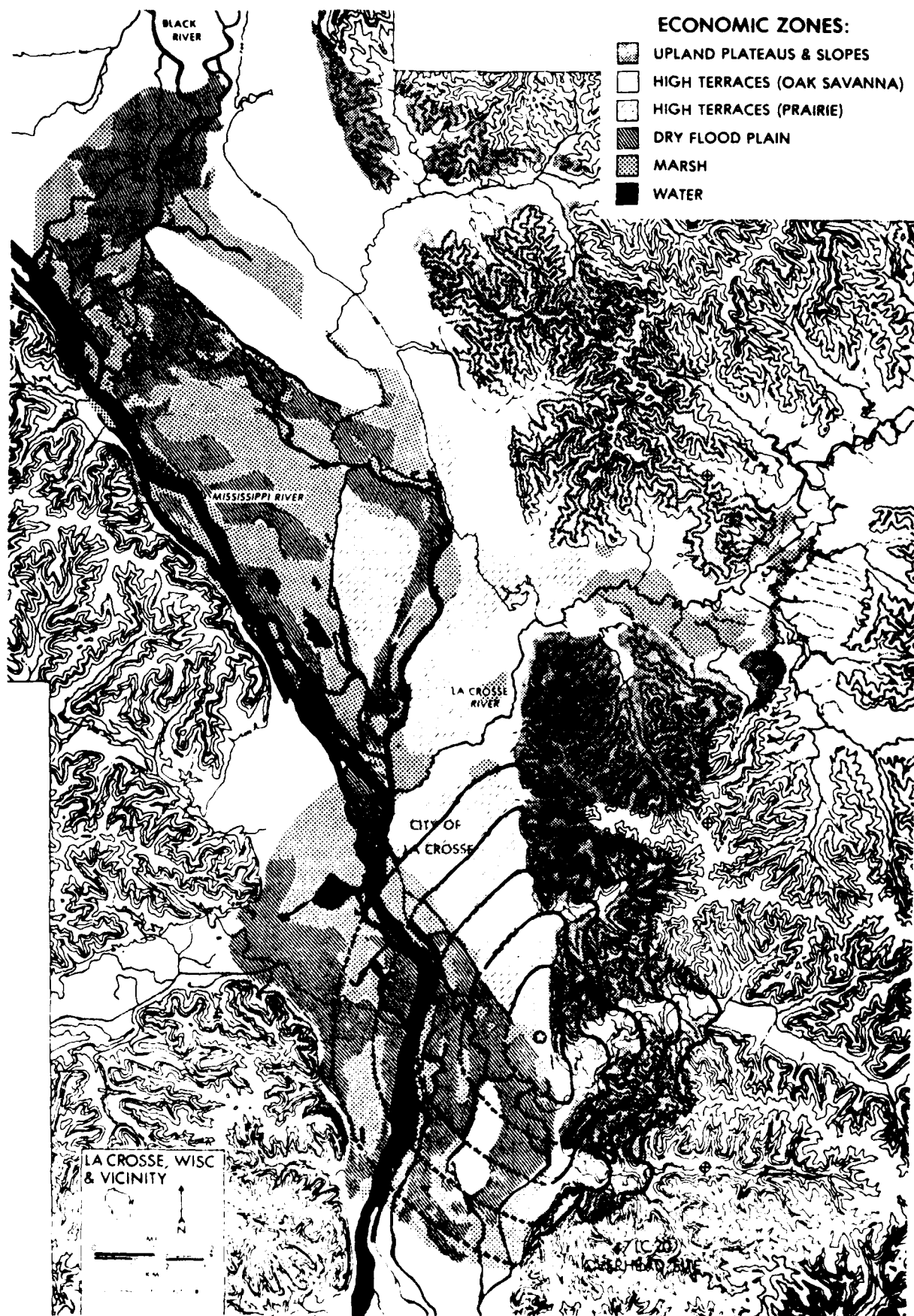


Figure 3: Site catchment of overland + Pinedale Creek after

Southward urban expansion of the City of La Crosse through the following decade prompted additional investigations at the Overhead Site, and the location and study of several other sites including the Pammel Creek Site. Figure 4 shows the location of known archaeological sites at the south end of the La Crosse terrace.

The Overhead Site was revisited in 1978 by the State Historical Society of Wisconsin's Highway Archaeologist, in conjunction with the replacement of the Highway 16, 61, and 35 overpass (Penman 1979:22-26). Penman's surface collection from the north half of the field reflected the Oneota component identified by Stoltman's excavations in this portion of the site. The southern half of the field, however, produced surface remains attributed to a Middle Woodland component. Based on the results of Stoltman and Penman's investigations, the Overhead Site was placed on the National Register of Historic Places in 1979.

In 1979 the University of Wisconsin-La Crosse undertook a controlled surface collection at the entire Overhead Site. This project recovered over 3,000 artifacts, and identified twelve concentrations or localities (Gallagher et al. 1981). Projectile points recovered during these surface collections revealed the presence of an Archaic component, in addition to the Middle Woodland and Oneota components identified earlier.

Plans to turn the Overhead Site area into an industrial park prompted intensive test excavations by the University of Wisconsin-La Crosse in 1980. Test excavations were conducted at the twelve localities identified in 1979, as well as at other areas of the site (Gallagher et al. 1981). These investigations verified the presence of Late Archaic, Middle Woodland, late Middle Woodland, Late Woodland, and Oneota occupations, which together span the last 3,000 years of the prehistoric era. The most spectacular find was the discovery of a plowed-down mound with intact Middle Woodland mortuary remains reflecting participation in the Hopewell Interaction Sphere. A collagen sample taken from one of these burials was dated to 110 B.C.  $\pm$  80 (BETA-1916) (Boszhardt 1982:138). Two burials with no associated remains, probably Oneota, were located at the north end of the site.

In 1983, the Orr Phase affiliation of the Oneota component at the Overhead Site was reevaluated through a comparison of ceramic assemblages from La Crosse area Oneota sites (Stevenson, Boszhardt, and Gallagher 1983). This study included the ceramics obtained during the 1979 and 1980 University of Wisconsin-La Crosse investigations. The results, although preliminary, indicate that not all of the Oneota Vessels from the Overhead Site can be classified as the Orr Phase type, Allamakee Trilled (Wedel 1959). Instead, the assemblage includes attributes similar to both Allamakee Trilled and Blue Earth Phase ceramics (Dobbs 1983), in addition to vessels anomalous to both of these phases.

Excavations at the Overhead Site were also undertaken in 1983 in conjunction with the initial development of the industrial park. These investigations were conducted by the Mississippi Valley Archaeology Center, and resulted in the recovery of Woodland (primarily late Middle Woodland) remains from the south end of the site, and additional Oneota remains primarily from the north end of the site (Sasso 1984).

During the 1980 investigations at the Overhead Site, the University of Wisconsin-La Crosse also conducted intensive test excavations at the Jim Braun

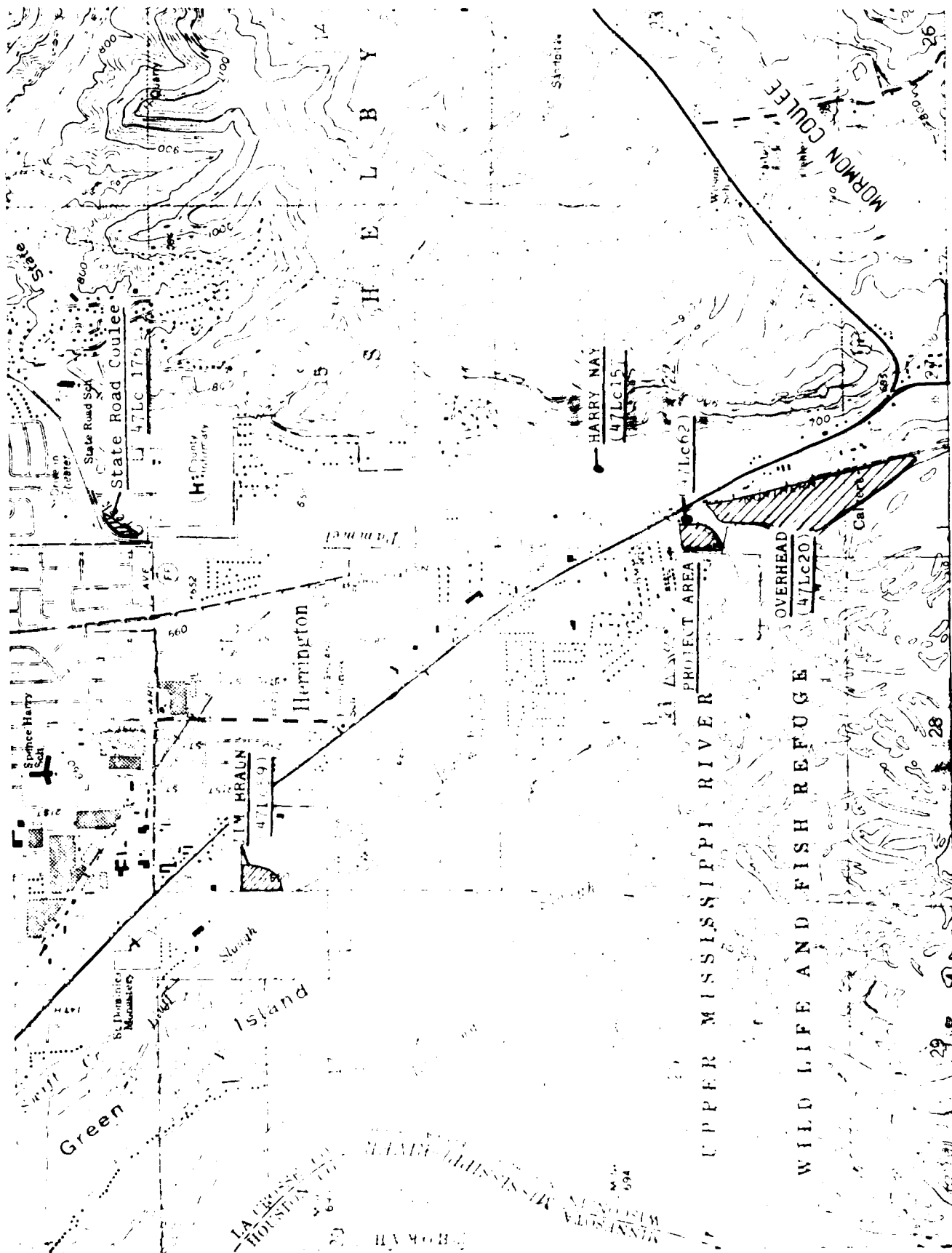


Figure 1. Known archaeological sites at the south end of La Crosse Terrace



Site (47Lc59). This site is located on the terrace edge overlooking the Mississippi River floodplain 2.5 km to the north of the Pammel Creek and Overhead Sites. These excavations concentrated on features which had been exposed during development-related stripping of the site. A large quantity of remains were recovered, of which only the ceramics have thus far been analyzed. The ceramic assemblage indicates that the site contained an Oneota component that may have intruded into an earlier Woodland occupation. The Oneota ceramics for the most part possess elements which are comparable to Blue Earth Phase traits; however, the overall assemblage is not typical of that phase (Stevenson, Boszhardt, and Gallagher 1983).

In 1980, the St. Paul District Corps of Engineers sponsored a survey along Pammel Creek in conjunction with plans for the State Road - Ebner Coulee flood control project (Hays et al. 1981). This survey found no significant cultural resources immediately adjacent to the existing creek; however, a potentially significant historic farmstead (47Lc62) was reported at the north end of the Overhead Site. In addition, the Pammel Creek Site (47Lc61) was discovered through systematic shovel testing of a formerly cultivated park, just across the creek and northwest of the Overhead Site. Remains at the Pammel Creek Site were concentrated in the western half of the park, which is bisected NE-SW by a storm sewer. To the west of the storm sewer, a 5 x 10 meter locality was found that contained apparently undisturbed cultural deposits, including Oneota pottery and floral and faunal remains.

A review of the 1980 field records and artifacts revealed that prehistoric materials had been recovered from nearly every shovel test hole in the western half of the park, and that the apparent in situ concentration was situated in about the center of this area (see Figure 7). Shovel probes in the eastern half of the park had produced only sporadic materials and suggested soil disturbance (Hays et al. 1981:22). The 1980 survey indicated that the 72" storm sewer appeared to conform to the boundary between the remaining site area in the west half of the park and the disturbed eastern half (Hays et al. 1981:28). The decreased frequency of cultural materials in the east half of the park, and a total absence in a shovel test transect opposite the creek suggested a physical separation between the Pammel Creek Site and the Oneota component at the north end of the Overhead Site even though the creek itself appears not to have been located here during the Oneota occupations at these sites.

One other site reported from the terrace at the south end of the City of La Crosse is an Oneota pit feature exposed during residential development to the northeast of the Pammel Creek Site in 1982. This site was reported as the Harry Noy Site (47Lc157) (Stevenson 1983). Periodic monitoring of this development has identified only sparse prehistoric materials.

In 1893, as part of the St. Paul District Corp of Engineers sponsoring of cultural resources investigations along Pammel Creek, the Mississippi Valley Archaeology Center discovered an Oneota cultural horizon at the mouth of State Road Coulee (Boszhardt and Gallagher 1984). The State Road Coulee Site (47Lc176) has recently been tested, and found to consist of an Oneota midden in the Pammel Creek floodplain which was sealed by historic alluvium. The midden produced Oneota ceramics, triangular points and other lithic tools, lithic debitage, and well preserved floral and faunal remains. The physical setting of the State Road Coulee Site compares to the Sand Lake Site (47Lc44) where Oneota ridged fields were located (Gallagher et. al. 1984, Boszhardt et. al.

1984). The recovery of large quantities of charred corn, and stratigraphic evidence suggest that the State Road Coulee midden may also have been ridged by the Oneota for agricultural purposes. A single radiocarbon date of A.D. 1550  $\pm$  60 (Wis 1584) was obtained from a sample of charred corn collected from the State Road Coulee midden.

Immediately to the south of the Overhead Site, at the end of the La Crosse terrace, is the mouth of Mormon Coulee. This coulee was formed by a fairly large non-glacial tributary of the Mississippi River, and a number of prehistoric sites have been reported from within its drainage basin. Detailed discussion of these sites is beyond the scope of this report; however, in general, diagnostic artifacts recovered from these sites are indicative of Archaic and Woodland encampments. The presence of comparable components at the south end of the Overhead Site and in Mormon Coulee may reflect seasonal settlement patterns of Archaic and Woodland groups.

#### METHODS

The initial stages of the field excavations at the Pammel Creek Site were designed to meet the objectives of the original scope of work: (1) to test the 5 x 10 meter locality where apparent in situ Oneota cultural remains had been located in 1980 to determine if the site was eligible for inclusion to the National Register of Historic Places; and (2) to ensure that other potentially significant remains in the park would not be overlooked by determining the extent of the site.

Following the reevaluation of the project scope of work, methodology shifted to mitigation of the site. The mitigation plan was based on research objectives outlined in Appendix E. These included looking for and evaluating possible structures, determining the age of the site and length of occupation, identifying the economic base through recovery and analysis of subsistence items and indicators of trade, and the relationship of the Pammel Creek Site to other Oneota sites in the region.

Field work began with coring, using a 1-inch diameter soil probe in order to relocate the in situ concentration identified in 1980. This process was aided by a relatively detailed field map from the 1980 survey. A metric grid system was established using a transit and tapes, and was tied to a permanent datum point (a pipe fixture at the northwest end of the park). Two small test units were excavated in order to identify the depth of the plow zone and gain other site stratigraphy information, and to verify the relocation of the in situ concentration.

In order to determine the extent of significant remains at the site, a series of ten 1-meter wide trenches were excavated with a backhoe to a depth of 25 cm, the base of the plow zone. These trenches were placed at 15-meter intervals along east-west grid lines, and were designated by the letters A through J. In addition, the plow zone was stripped from a 15 x 15 m area (Area A), which encompassed the in situ concentration identified in 1980 (Figure 5).

Artifact concentrations or other indications of cultural features uncovered by the backhoe, were marked with flags as they were exposed by the machine. Artifacts from disturbed contexts were collected at this time and

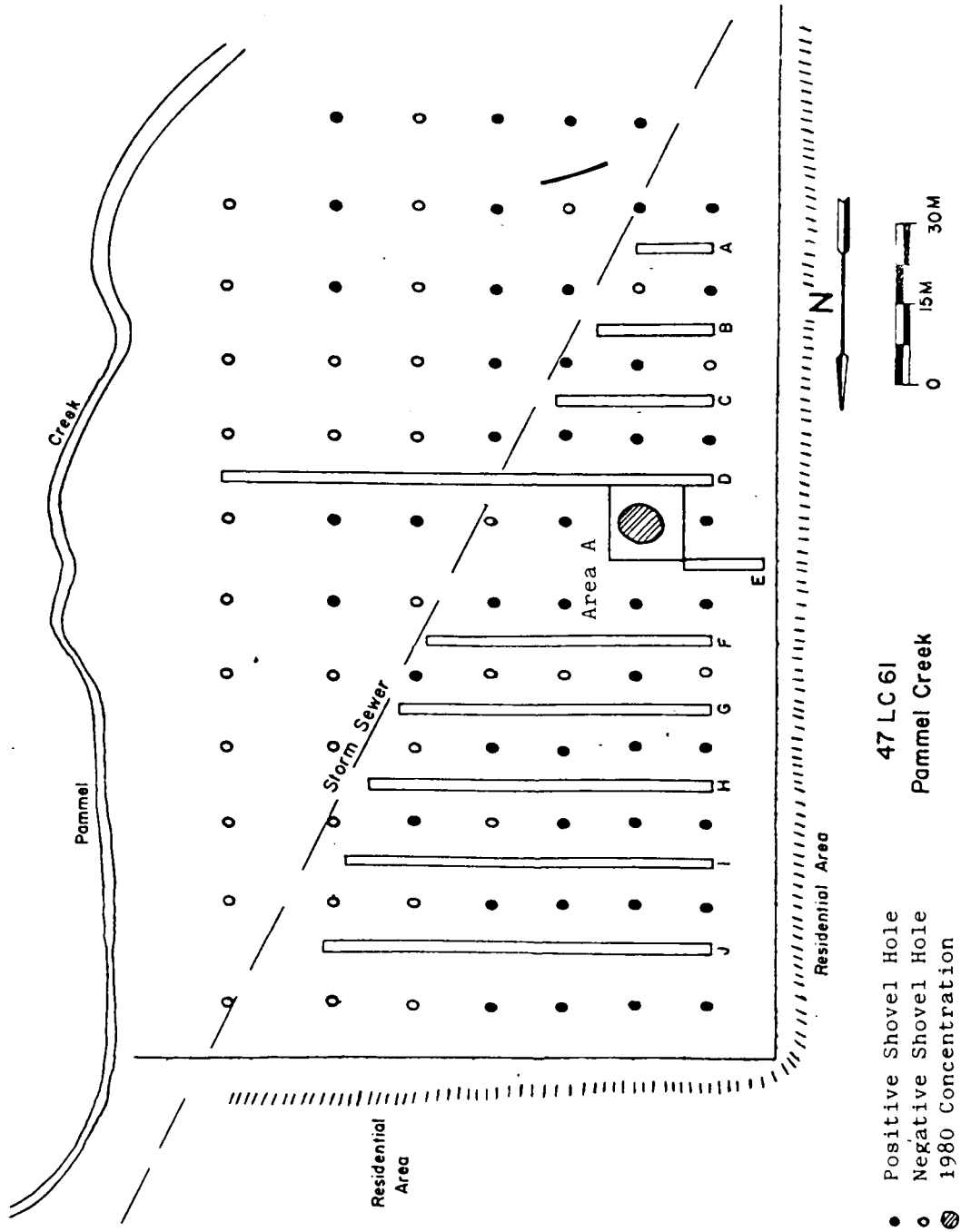


Figure 5: Approximate locations of 1980 shovel test holes, and 1983 excavations

following periods of rain. The floors of both the trenches and Area A were carefully skim-shoveled to allow better identification of in situ cultural deposits (Figure 6). Each potential feature was assigned a number, and its provenience coordinates recorded.

Due to the unexpectedly high number of potential features, most feature hand excavations were limited to cross-sectioning with trenches (Figure 7). Those features chosen for excavation were first troweled on the surface in order to identify their horizontal extent. The cross-section trenches were usually 20 to 30 cm wide, and were excavated in arbitrary 5 or 10 cm levels until culturally sterile soil was reached. When distinctive cultural zones such as ash lenses were encountered within feature trenches, these were excavated separately. Feature excavation forms were maintained for each level. All excavated soil was screened through 1/4-inch mesh hardware cloth, with the exception of large matrix samples collected from feature levels for flotation or fine waterscreening in the laboratory. All artifacts were bagged and given a field lot number to ensure correct provenience recording. Charcoal samples were collected for radiocarbon dating. One wall of each feature cross-section trench was chosen for profile mapping and photographing. Soil samples were then collected from any cultural zones visible in the profiles. The feature trenches were then marked with plastic or other modern materials and back-filled, usually leaving a large portion of the feature intact. A few features were completely excavated.

Laboratory procedures included washing, stabilizing, sorting, and cataloging the recovered artifacts. Soil matrix samples were processed at the laboratory through flotation or fine water-screening with graduated screen sizes. Selected flotation samples were microscopically sorted to remove identifiable faunal and floral remains. Artifact analysis was begun during the initial sorting. Lithic materials were separated into recognizable tools (e.g., projectile points, scrapers, knives, drills, retouched or utilized flakes, abraders and other ground stone), and lithic reduction categories. Fire-cracked rock was collected and weighed, but not saved. The classification scheme for the lithic reduction categories includes cores, six stages of bifaces, and five categories of flakes or debitage. The biface stages are defined as follows:

Stage 1 (biface cores): These are usually large blocky cores with a rough, sinuous edge produced by percussion (usually hard hammer) techniques. Often these contain cortex or unmodified surfaces.

Stage 2 (biface preforms): Typically these have finer sinuous edges from more careful percussion (e.g., soft hammer) flaking. They often are oval or leaf-shaped, and both surfaces are typically flaked.

Stage 3 (knives): These are bifaces which have been shaped and modified by pressure flaking along the edges, but are morphologically distinct from diagnostic projectile point types. Their edges are usually straight, although in form, they may be asymmetrical from use and resharpening.

Stage 4 (point preforms): These are essentially crude projectile points which appear to have been left unfinished for one reason or another, such as poor quality material or step-fracture platforms which would prove extremely difficult to remove for further thinning. Their edges are normally not straightened by final pressure flaking.



Figure 6: Excavations at Area A

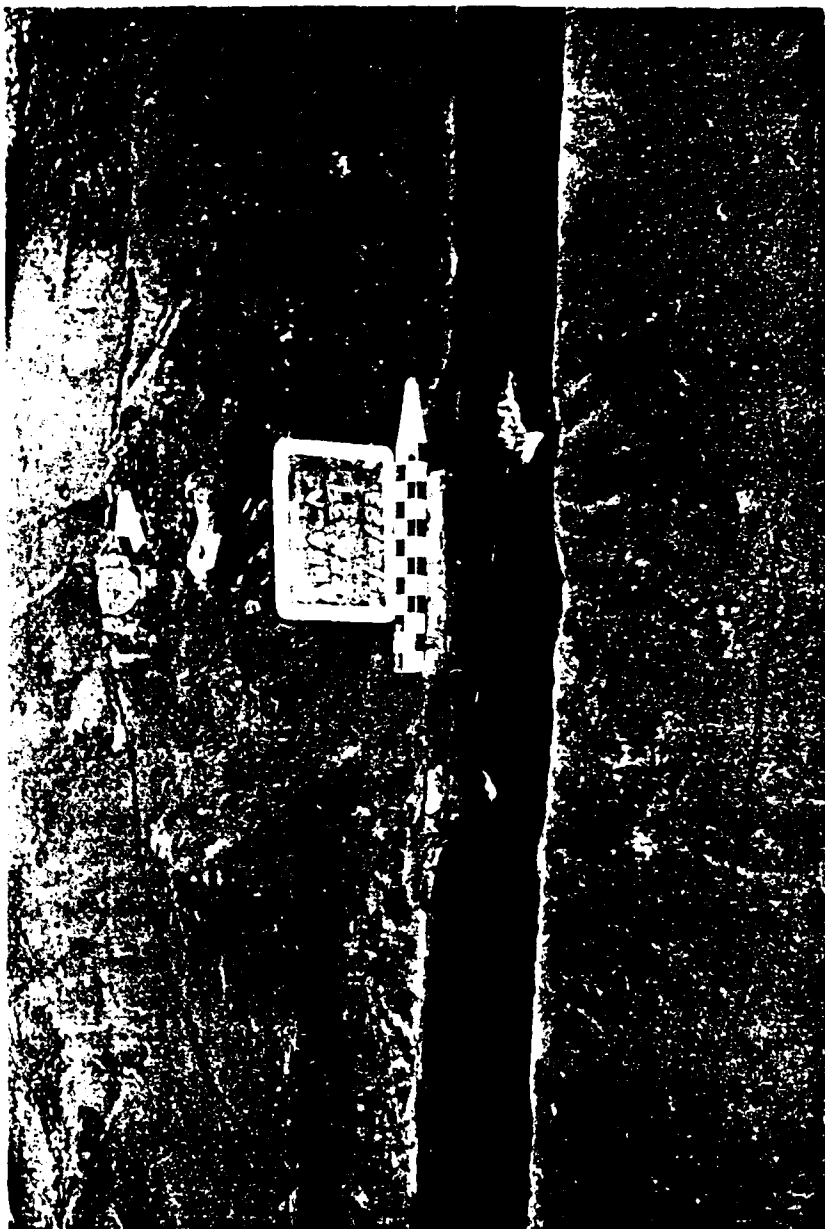


Figure 7: Example of Feature trench excavation

Stage 5 (projectile points): These are finished points which can be compared to projectile point typologies. Their edges are straight from final pressure flaking, and the basal section for hafting is present. Occasionally these have asymmetrical sides as would a knife; however, if a diagnostic base is present, the artifact is included within this category.

Stage 6 (point/knife fragments): These are broken fragments of finished bifaces with straight edges from pressure flaking. The category includes pieces which cannot be attributed by shape to either category 3 (knives) or 5 (points). Most commonly, these are tips or edge fragments.

Debitage categories employed in sorting the lithic materials consist of primary flakes, secondary flakes, tertiary flakes, chips, and shatter. Primary flakes include those with cortex on more than 100% of the dorsal surface, and are assumed to represent primary reduction of a core or biface. Secondary flakes exhibit at least some cortex on the dorsal surface. Tertiary flakes have no cortex. Chips are flakes less than 2 cm in size, with or without cortex. The category "shatter" consists of blocky pieces with no evidence of a striking platform, bulb of percussion, recognizable ventral surface, or flake scars.

Lithic raw materials were inventoried by separating chert from silicified sandstone in all categories of tools and debitage. In addition, lithic tools and bifaces were analyzed in terms of more specific raw material sources.

Ceramics were sorted first by temper. These groups were then subdivided into decorated sherds and rims, and undecorated body sherds. The decorated sherds were analyzed in terms of characteristics which could be used to interpret cultural affiliation on the basis of previously defined types.

As nearly all of the ceramics recovered from the Pammel Creek site are shell tempered, and come from Oneota vessels, the decorated sherds and rims were sorted by categories which would allow comparison to other La Crosse area Oneota ceramic assemblages recently analyzed by Katherine Stevenson (Stevenson, Boszhardt, and Gallagher 1983). These categories consisted of sherds decorated with tool trails, finger trails, or punctations; and rims with tool or finger decoration on the interior, top, or exterior of the lip. In addition, loop and strap handles were counted.

Floral and faunal remains were separated into identifiable and unidentifiable categories at the Mississippi Valley Archaeology Center laboratory. Selected samples of the identifiable specimens were then sent to consultants. The faunal remains were identified by James L. Theler. The floral remains were primarily identified by Leonard Blake of Washington University in St. Louis. Unidentified floral remains were also examined by Katherine Stevenson of the Mississippi Valley Archaeology Center. Selected charred samples were submitted to the University of Wisconsin radiocarbon laboratory for assay.

The sorted materials were catalogued according to a system used at the Mississippi Valley Archaeology Center. This system includes the year of the project, an acquisition number representing each provenience, and a separate catalogue number for each artifact. The materials recovered during this project are catalogued within the blocks 83.01 - 83.149 and 83.251 - 83.532, and

all are curated at the Mississippi Valley Archaeology Center at the University of Wisconsin-La Crosse.

## RESULTS

A total of 725 sq meters of the project area was exposed through the excavation of Trenches A-J and Area A. Inspection of these areas revealed 82 possible cultural features, indicating that the distribution of cultural remains is far more extensive than the 50 sq meter area suggested from the 1980 Phase I survey. The natural soil stratigraphy at the site made feature identification difficult; however, hand excavation of 47 of the 82 possible features demonstrated that 45 represented undisturbed cultural deposits. These remains consisted of deep storage or refuse pits, shallow basin pits, general midden concentrations, and a cache of bison scapula hoes.

A total of 9257 artifacts were recovered during the investigations at the Pammel Creek Site (Appendix A). These include lithic tools and debitage, ceramic sherds, and faunal and floral remains. Analysis and interpretations of these remains suggest that the project area was an intensive Oneota habitation site. Two charcoal samples were sent to the Radiocarbon Laboratory at the University of Wisconsin, Madison. These samples were obtained from Features 2 and 7 and yielded assayed dates of A.D. 1470  $\pm$  70 (WIS-1523) and A.D. 1520  $\pm$  70 (WIS-1524) respectively.

### Extent of Site

The 1980 Phase I survey of the project area recovered prehistoric cultural materials throughout the western half of the park; however, virtually none were recovered from the eastern edge (see Figure 5). In addition, a 5 x 10 meter locality within the western half of the park was found to contain a high density of lithic, ceramic, floral, and faunal remains, suggesting the presence of an Oneota midden. Although the exact dimensions of the site were not determined during the Phase I survey, the site was reported as consisting only of the 50 m<sup>2</sup> midden only.

Ten trenches (A-J) were excavated across the western half of the park to better ascertain the extent of undisturbed cultural remains. Features were detected in all ten of the trenches, correlating fairly closely with the distribution of positive shovel test holes from 1980. The distribution of features encompassed the west edge of the park, where the land begins to rise to the Sherwood Heights subdivision, and continued to the east for approximately 65 meters (Figures 8 and 9). The extent of undisturbed cultural deposits at the Pammel Creek Site is at least 5400 m<sup>2</sup>.

Neither the exact limit of the remaining cultural deposits at the site, nor their original extent, is known. Given the presence of features in the southernmost and northernmost trenches (A and J respectively), it is likely that significant portions of the site extend in those directions, at least to the southern and northern boundaries of the park. At the southern end, trenches A-C did not extend eastward of the 72-inch storm sewer, beyond which cultural materials were encountered during the 1980 shovel testing, and it seems likely that in situ deposits extend east of Trench A for another 20 meters.

Furthermore, the site appears to have extended onto the terrace rise to the west of the park. Gallagher et al. (1981:7-8) reported hearing that human



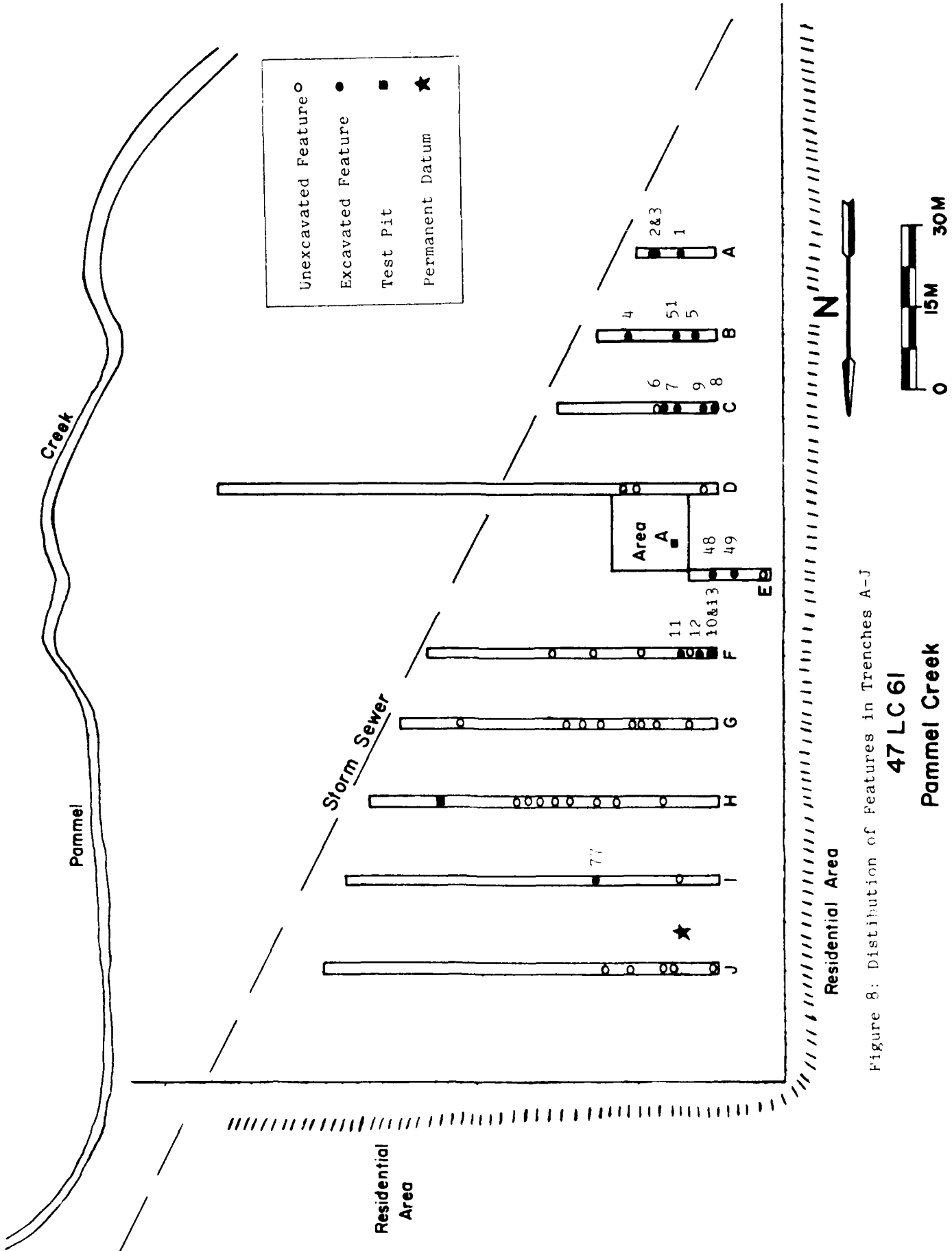


Figure 8: Distribution of Features in Trenches A-J

47 LC 61

Pammel Creek

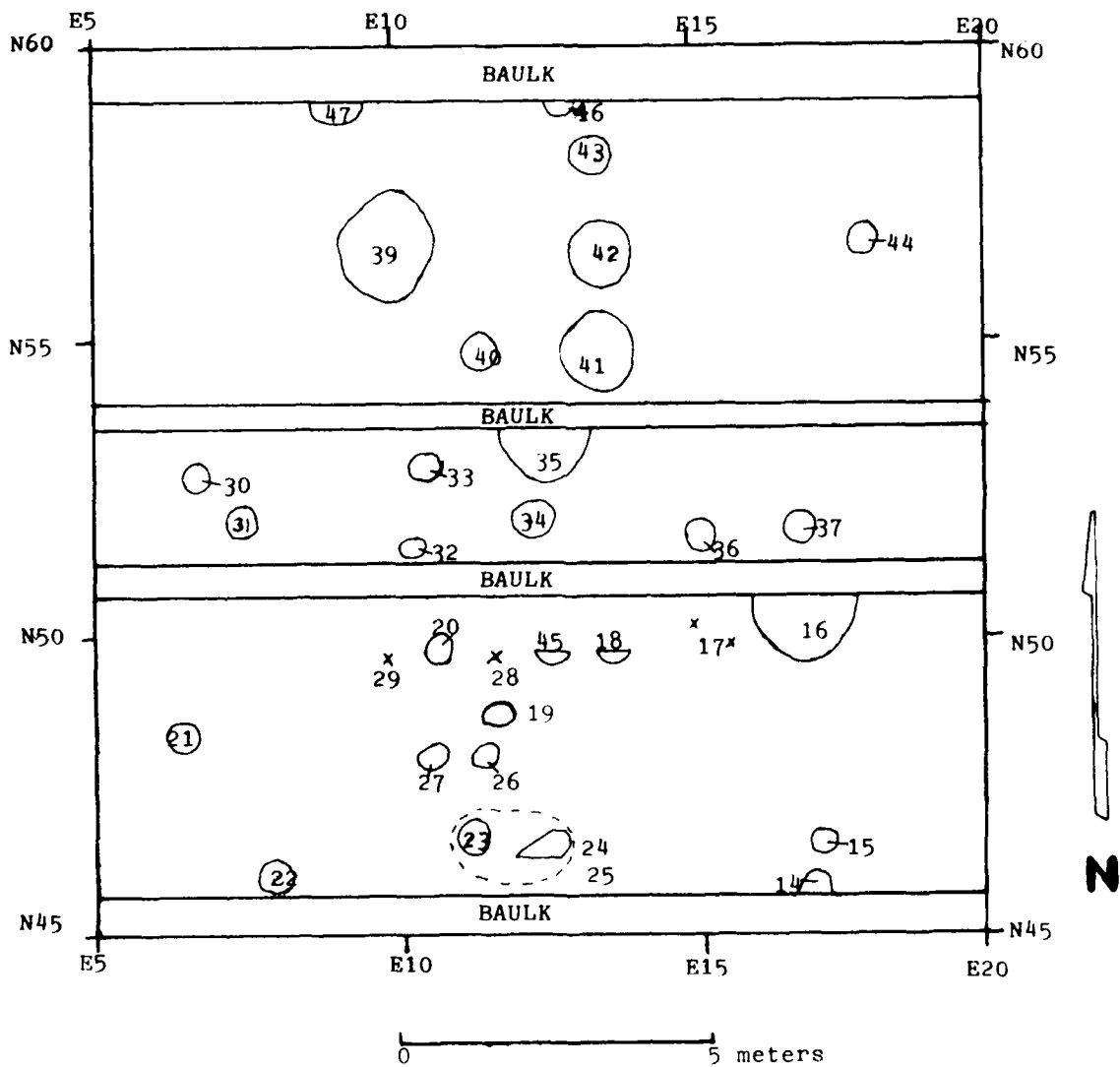


Figure 9: Distribution of Features in Area A

burials had been disturbed during the grading of the terrace for the subdivision. Trench E, which extended west to the base of the terrace rise, contained three features, one of which (Feature 49) was situated at the westernmost edge of the park, where the terrace begins to rise above the park. It seems unlikely that Feature 49 is the westernmost feature of the original site; however, no investigations were conducted on the private land in the subdivision. Additional evidence of the site formerly extending onto the terrace was provided by Mr. J. Grimes, who worked on the installation of the sewer lines during the development of Sherwood Heights. Mr. Grimes brought to the site a large rim section of an Oneota vessel (Appendix G), which he stated had been found in a "fire place" exposed seven feet south of the last manhole in Nottingham Road, or 45 meters west of the project area. Mr. Grimes also reported that a burial had been disturbed on a rise north on Nottingham Road. Thus the original dimensions of the Pammel Creek Site may never be known. Portions of the terrace rise to the north and west of the park, including a possible cemetery, have been severely disturbed through the development of Sherwood Heights. It is possible, however, that cultural deposits remain in yard areas, and Mr. Grimes also indicated that dredge spoil may have been used as fill in the subdivision, thereby possibly preserving some cultural deposits.

#### Site History

Historic artifacts were encountered sporadically across the exposed areas of the project area. Stratigraphically, these were restricted to the plow zone. Appendix A includes the location of recovered historic artifacts. Historic artifacts from features were always found in disturbed contexts, such as trowel-scraped surfaces or rodent burrows.

The historic artifacts recovered represent activities which have occurred since American settlement of this area in the mid-nineteenth century. These consisted of cinders and unburned coal fragments, nails (mostly round), a few pieces of glass and porcelain, and very recent items such as flip tops from beverage cans. Hays et al. (1981:5-10) noted that this area may correspond with the "Merrick Field" illustrated on the 1846 Government Land Office plat map of T15N R7W; therefore, it may represent one of the earliest tracts cultivated by American settlers on the La Crosse terrace. In addition, Hays et al. suggest that the Lamb farmstead (47Lc62), immediately east of Pammel Creek from the project area, may date to 1874 or possibly earlier.

A large rectangular area at the north end of the project area is clearly visible on a 1978 aerial photograph obtained from the Wisconsin Department of Transportation (see Figure 2). During later excavations conducted in that vicinity, a greater quantity of historic materials was encountered than during Phase II testing to the south, suggesting that this rectangularly shaped feature may represent a former historic structure. The outline is not visible on a 1969 aerial photograph; however, the park was evidently cultivated at that time.

The project area was transformed into a park, in conjunction with the development of the Sherwood Heights residential subdivision, during the early 1970s. During this period, a storm sewer pipe 72 inches in diameter was buried diagonally (NE-SW) across the park. Public park equipment consisting of a baseball backstop, slide, and swing were placed in the northeast quarter.

Residents of Sherwood Heights also stated that the western edge of the park had been occupied by family gardens. These activities are reflected by Feature 6, a concentration of fish bone and decaying fragments of newspaper. The neighboring residents acknowledged that they had disposed of fish wastes by burial in the garden.

### Stratigraphy

Excavations at the Pammel Creek Site revealed a simple and homogeneous natural soil stratigraphy. The natural A Horizon consists of a dark (10YR3/2) sandy loam which extended to an average depth of 50 to 60 cm below the surface. A mottled, sandy B Horizon (10YR3/4), approximately 30 to 40 cm thick separated the A horizon from a light sandy (10YR4/4-5/4) C Horizon parent material. Excavation of Feature 2 encountered a reddish sandy clay at a depth of 135 cm.

As noted earlier, historic records indicate that the site may have been cultivated by settlers as early as 1846, and is known to have been cultivated as recently as 1969. However, during the 1983 excavations, the interface between the plow zone and the top of undisturbed A Horizon was rarely discernable. Thus, machinery excavations of Trenches A - J and Area A arbitrarily removed 25 cm (the average plow zone depth in this area) from the surface. At this depth, undisturbed cultural remains were exposed, and were identified as possible features, based on the presence of notable cultural remains such as fire-cracked rock, shell, or other artifacts.

Unfortunately, the depth of the A Horizon made feature definition difficult. Were it not for the presence of cultural materials at the base of the plow zone, few of the 82 possible features would have been identified. The dimensions of these features were not revealed until hand excavations had reached of the lighter B Horizon and, therefore, only those features extending more than 50 cm below the surface were definable in plan view, and allowed cross-section profiles to be drawn. Many of the tested features did not extend to the B Horizon precluding identification of shape. Furthermore, features with no cultural remains at the base of the plow zone would not have been recognized. For example, Feature 45 (a shallow basin pit) was not visible on the scraped surface of Area A, but was identified in the trench excavation of Feature 18 (see Figure 16). Consequently, the actual number of cultural features within the exposed areas remains unknown.

### Features

Of the 82 possible features identified during the machinery excavations of trenches A-J and Area A, 49 were at least partially excavated by hand. These efforts revealed that 47 of the 49 were prehistoric cultural features, which varied widely in form and content. Several deep pit features extended well into the C Horizon. The features often contained abundant refuse; however, a few contained only sparse artifacts in a fill consisting of dark organically stained sandy loam indistinguishable from the natural A Horizon (see Figures 10-14). Other artifact concentrations were found to either cap or be contained in slight depressions where the dark organic sandy loam dipped into the B Horizon (Figures 15-17). These appear to be shallow basin pits, although their sides were not discernable from the homogeneous A Horizon other than by changes in artifact density.

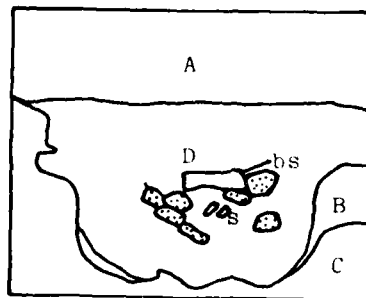


Figure 10: Example of deep refuse pit (profile)



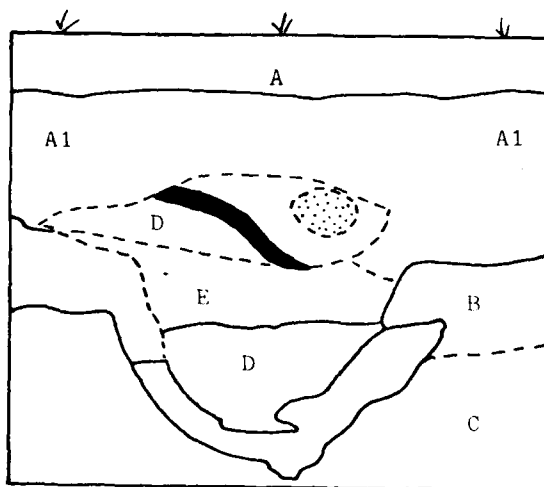
Figure 11: Example of refuse pit

# FEATURE 4



- A Plow Zone (10YR3/2)
- B B-Zone (mottled) (10YR3/3)
- C C-Zone (10YR5/4)
- D Feature Fill (10YR3/2)
- bs bison scapula
- s shell
- Fire-Cracked Rock

# FEATURE 46

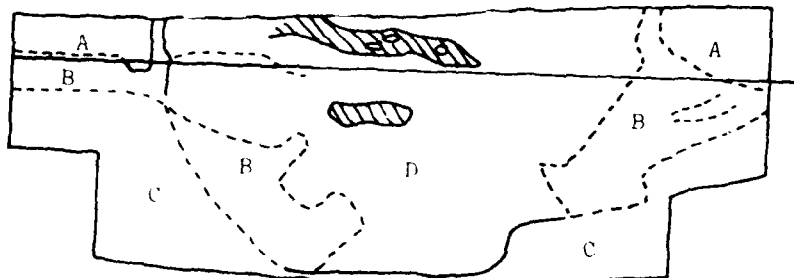



- A Plow Zone (10YR3/2)
- A1 Natural A Zone
- B B-Zone (mottled) (10YR3/3-4/3)
- C C-Zone (10YR4/4)
- D Feature Fill (mottled) (10YR3/3-4/3)
- E Dark Feature Fill
- Fire-Cracked Rock
- Rodent Run

0 50  
cm.

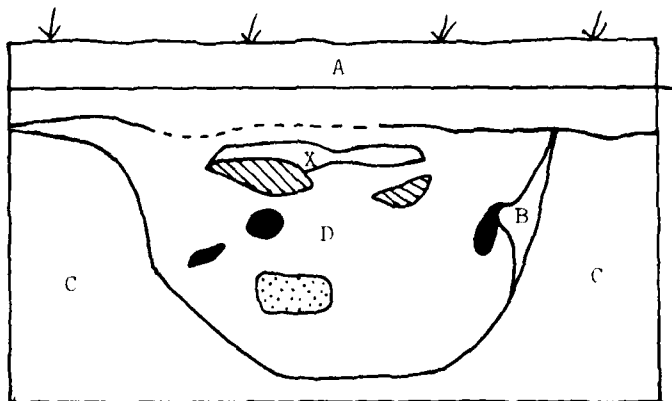
Figure 12: Profiles of deep refuse pits




## FEATURE 7



- |                              |  |
|------------------------------|--|
| A Plow Zone (10YR3/2)        | C C-Zone (10YR4/4)   |
| A1 Natural A-Zone (10YR3/2)  | D Feature Fill (10YR2/2)   |
| B B-Zone (mottled) (10YR2/4) |  Ash Lens |

## FEATURE 9



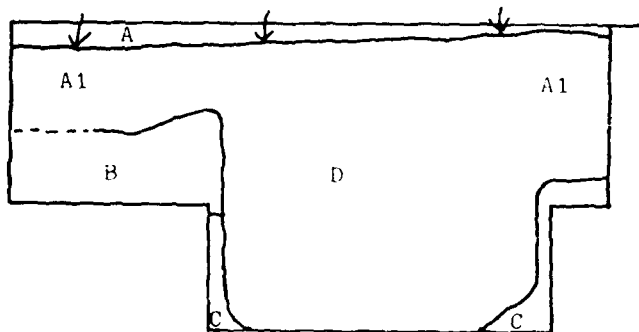
- |                              |   |
|------------------------------|---|
| A Plow Zone (10YR3/2)        | X Charcoal Lens   |
| B B-Zone (mottled) (10YR3/4) |  Ash Lens          |
| C C-Zone (10YR4/4)           |  Fire-Cracked Rock |
| D Feature Fill (10YR3/3)     |  Rodent Burrows    |

0 ————— 50  
cm.

Figure 13: Profiles of deep refuse pits

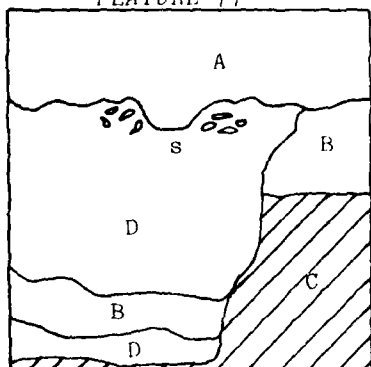


# FEATURE 40



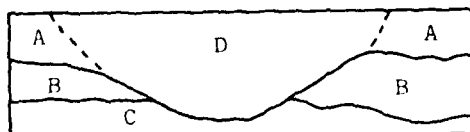
- A Plow Zone (10YR3/2)
- A1 Natural A-Zone (10YR3/2)
- B B-Zone (mottled) (10YR3/3)
- C C-Zone (10YR4/4)
- D Feature Fill (10YR3/2)

# FEATURE 77



- A Plow Zone (10YR3/2)
- B B-Zone (mottled) (10YR3/4)
- C C-Zone (10YR4/4)
- D Feature Fill (10YR3/2)
- s shell

# FEATURE 37

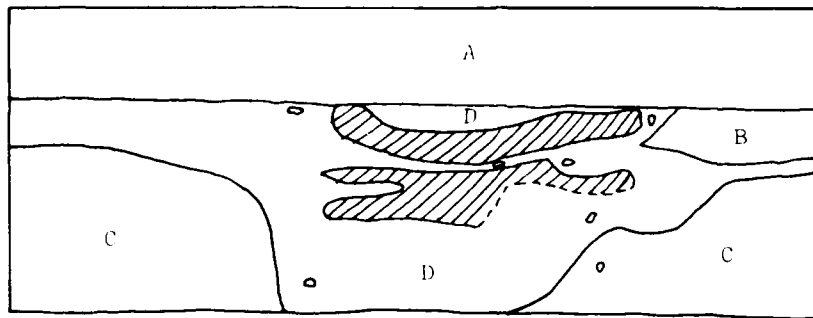


- A Natural A-Zone (10YR3/2)
- B B-Zone (mottled) (10YR4/3)
- C C-Zone (10YR4/4)
- D Feature Fill (10YR3/2)

0 50  
cm.

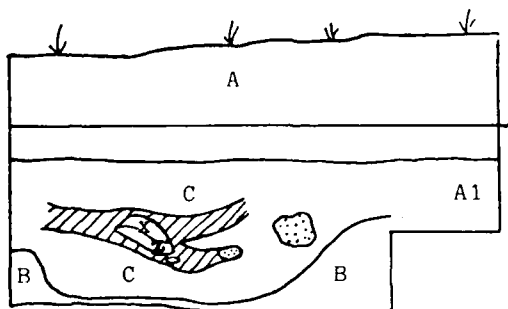
Figure 14: Profiles of deep refuse pits

FEATURE 13



- A Plow zone (10YR3/2)  
 B B-Zone (mottled) (10YR3/4)  
 C C-Zone (mottled) (10Yr4/4)  
 D Feature Fill (10YR3/2)  
 ▨ Ash Lenses

FEATURE 49



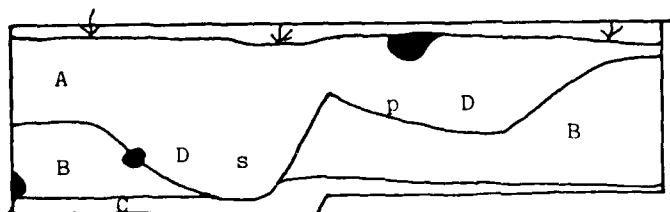
- A Plow Zone (10YR3/2)  
 A1 Natural A-Zone (10YR3/2)  
 B B-Zone (mottled) (10YR3/4)  
 C Feature Fill (10YR3/2)  
 x Rubbish Stain (10YR2/2)  
 z Ash lens (10YR6/4)  
 ▨ Charcoal Lens  
 ▩ Fire-Cracked Rock

0 ————— 50  
 cm.

Figure 15: Profiles of refuse pits

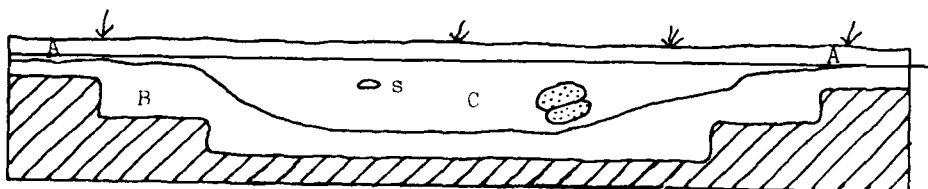
FEATURE 45

FEATURE 18



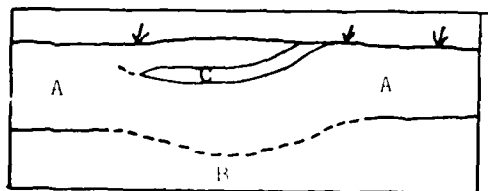
- A Natural A-Zone (10YR2/2)
- B B-Zone (mottled) (10YR3/4)
- C C-Zone (10YR4/4)
- D Feature Fill (10YR2/2)
- s shell
- p pottery sherd
- Rodent Run

FEATURE 39



- A Natural A-Zone (10YR3/2)
- B B-Zone (mottled) (10YR4/3)
- C Feature Fill (10YR3/2)
- s shell
- Fire-Cracked Rock

FEATURE 42

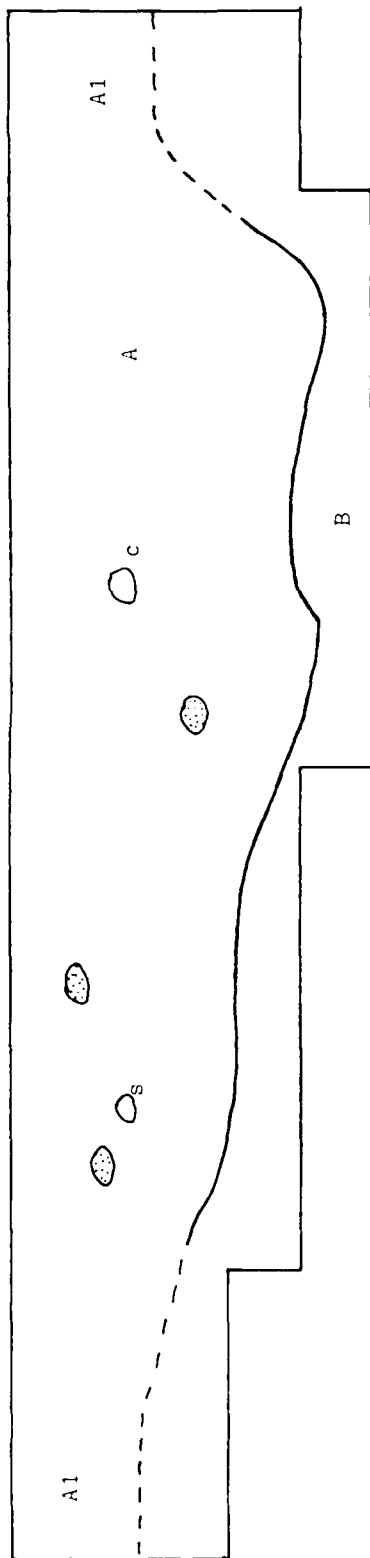


- A Natural A-Zone Feature Fill (10YR3/2)
- B B-Zone (mottled) (10YR4/3)
- C Reddish Speckled sandy loam (10YR5/8)

0 50  
cm.

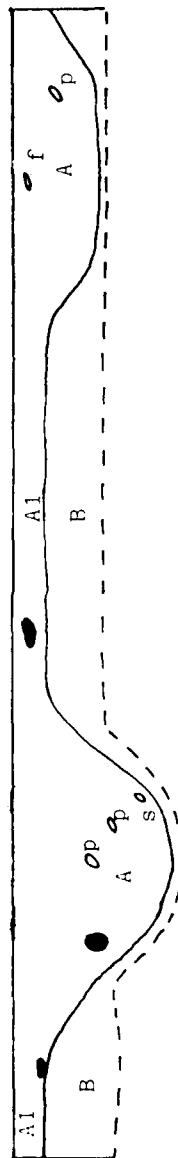
Figure 16: Profiles of shallow refuse basins

FEATURE 41



- A Feature Fill (10YR2/2)
- A1 Natural A-Zone (10YR2/2)
- B B-Zone (mottled) (10YR4/4)
- s shell
- c charcoal
- Fire-Cracked Rock

FEATURE 28



- A Feature Fill (10YR3/4)
- A1 Natural A-Zone (10YR3/4)
- B B-Zone (mottled) (10YR4/4)
- f flake
- p pottery sherd
- s shell
- Rodent B. row

Figure 17: Profiles of shallow refuse basins

The natural A Horizon was found to contain an artifact scatter with several concentrations which did not extend below the natural A Horizon (Figure 18). These may represent midden concentrations or shallow pits, which could not be defined. A fourth type of feature was represented by a cache of four bison scapula hoes (Figure 19). This feature was contained entirely within the natural A Horizon, and no evidence of a pit was observed.

Two of the possible features were found not to be prehistoric cultural deposits. Feature 5 was a burned tree root, and Feature 6 was a recent burial of fish bones by a resident of Sherwood Heights subdivision.

A brief summary of the tested features and their contents is presented below. Appendix A lists the cultural materials recovered from each feature.

Feature 1: Located in Trench A (N-1, E-6.75). This was a shallow basin refuse pit which was identified on the basis of a concentration of fire-cracked rock at the base of the plow zone. The feature contained only a few flakes, some Oneota tool-trailed pottery and unidentified bone in addition to the fire-cracked rock.

Feature 2: Located in Trench A (N-0.5, E-10.6). This feature was a deep, bell-shaped pit. At the base of the plow zone, yet within the natural A Horizon, the feature appeared as a concentration of fire-cracked rock. At a depth of 55 cm the feature was roughly circular and intruded into the B Zone. General refuse was recovered from the upper levels; however, at a depth of 75 cm, the feature fill became ashy and filled with fish bone and charred floral remains. A charcoal sample obtained from this level produced a C-14 date of A.D. 1470  $\pm$  70 (WIS-1523). Additional refuse fill was recovered below the ash lens including mammal bone, bird bone and egg shell fragments, fish bone, the intact shell of a painted turtle, lithic tools and debitage, a copper bead, and Oneota ceramics.

Feature 3: Located in Trench A (N-0, E-10.0). This feature was located immediately adjacent to Feature 2, but not visible until excavation of Feature 2 had reached the top of the natural B Zone. At that point, all that remained of Feature 3 was a 15 cm deep concentration of bone, shell, lithics, pottery, and other refuse. This feature is interpreted as representing a shallow basin refuse pit.

Feature 4: Located in Trench B (N-15, E16). This was a shallow basin pit containing fire-cracked rock, some pottery, and a well worn bison scapula (Figures 11 and 12). The feature represents a refuse pit.

Feature 5: Located in Trench B (N-15, E-4.5). This feature was noticed as a charcoal concentration at the base of the scraped plow zone. Excavation revealed that this was not a cultural feature, but a burned out tree root.

Feature 6: Located in Trench B (N-15, E-2). This was a concentration of fish bone which was associated with decaying newspaper. It represents a recent disposal of fish waste by a resident of Sherwood Heights.

Feature 7: Located in Trench C (N-29, E-6). This feature was similar to Feature 2 in being a deep refuse pit with an ash lens and general refuse throughout the top half (Figure 13). The bottom half contained only dark fill,



Figure 18: Example of midden concentration



Figure 19: Cache of 4 bison scapula hoes (feature 12)

and may represent storage of decomposable organic materials prior to use of the pit for refuse. A charcoal sample from this feature was assayed and yielded a date of A.D. 1520  $\pm$  70 (WIS-1524).

Feature 8: Located in Trench C. This consisted of fire-cracked rock at the base of the plow zone. Further investigation produced no cultural materials. This may represent the base of a very shallow pit feature, or more likely, an isolated occurrence of the natural A Horizon within the midden.

Feature 9: Located in Trench C (N-29, E-1.5). A deep refuse pit much like Features 2 and 7, containing an ash lens with large quantities of fish bone (Figures 10 and 13).

Feature 10: Located in Trench F (N-75, E-2). This feature consisted of a layer of midden refuse within the natural A Horizon (Figure 18). Excavation revealed no additional depth to the deposit, and this feature is interpreted as a midden concentration.

Feature 11: Located in Trench F (N-74, E8). This feature was identified as a concentration of pottery, fire-cracked rock, and shell at the base of the plow zone. Excavation of the south half revealed a refuse pit which extended into the mottled natural B Zone. The refuse contained, among other artifacts, a human tibia.

Feature 12: Located in Trench F (N-74.5, E-3.3). This feature consisted of four bison scapula hoes (Figure 19). These were located just below the plowzone within the natural A Horizon. No other cultural materials were associated with the scapulas, and the feature is interpreted as a cache.

Feature 13: Located in Trench F (N-74, E-1.25). This feature contained mixed refuse including an ash lens, in a pit which extended into the natural C Zone (Figure 15).

Features 14 and 15: Located in Area A. These were like Feature 8, consisting of isolated artifacts in the Natural A Horizon.

Feature 16: Located in Area A (N-50, E-16-18). This feature consisted of a shallow basin pit with relatively few artifacts.

Feature 17: Located in Area A (N-50, E-14.5-15.5). This feature consisted of a few artifacts at the base of the plow zone. Excavation to the top of the natural B Zone in a narrow trench revealed no definition, although artifacts were recovered. This appears to represent a portion of the general midden debris contained within the natural A Horizon.

Feature 18: Located in Area A (N-49.5, E-12). This is a shallow basin pit containing a relatively small amount of materials (Figure 16).

Feature 19: Located in Area A (N-48.7, E-12). This was identified on the basis of a charcoal stain at the base of the plow zone. A bisecting trench recovered artifacts to the top of the natural B zone, but with no definition. This feature is similar to Feature 17, in being a portion of the general midden within the natural A Horizon.



Feature 20: Located in Area A (N-49, E-10.5). Like Features 8, 14, and 15 in not being a pit feature, but isolated artifacts from the midden refuse.

Feature 21: Located in Area A (N-48.5, E-6.5). A trench excavation based on the presence of charcoal and fire-cracked rock at the base of the plow zone revealed scattered midden debris within the natural A Horizon.

Feature 22: Located in Area A (N-46, E-8). Same results as Feature 21.

Feature 23: Located in Area A (N-47, E-10-12). This is a shallow basin refuse pit which was sampled with a cross-section trench.

Feature 24: Located in Area A (N-46, E-11). A shallow basin refuse pit similar to Feature 23.

Feature 25: Located in Area A (N-46, E-12). Found to be surface materials associated with Feature 24.

Feature 26: Located in Area A (N-48, E-12). A shallow basin refuse pit like Features 23 and 24.

Feature 27: Located in Area A (N-48, E-12). Found to be part of Feature 26.

Feature 28: Located in Area A (N-49, E-11.5). A shallow basin refuse pit which extended to the base of the natural B Zone (Figure 17).

Feature 29: Located in Area A (N-49.5, E-9.8). A shallow basin pit within the natural A Horizon (Figure 17).

Feature 30: Located in Area A (N-53, E-8). Isolated midden debris.

Feature 31: Located in Area A (N-53, E-7.5). A shallow basin refuse pit.

Feature 32: Located in Area A (N-51.5, E-10.25). Midden deposit within the natural A Horizon.

Feature 33: Located in Area A (N-53, E-10.5). Scattered midden deposits, including a deer mandible, within the natural A Horizon.

Feature 34: Located in Area A (N-53, E-11.75). This feature consisted of a charcoal concentration within the natural A Horizon. A few scattered midden artifacts were also exposed in the trench excavation.

Feature 35: Located in Area A (N-53.2, E-13.2). A midden concentration within the natural A Horizon, or a shallow pit. The materials did not extend into the lighter subsoils precluding definition of its edges.

Feature 37: Located in Area A (N-51.6, E-16.55). A shallow basin pit containing a sparse amount of artifactual material (Figure 14).

Feature 39: Located in Area A (N-57, E-10.4). A shallow basin refuse concentration (Figures 6 and 16).

Feature 40: Located in Area A (N-55, E-10.5). This was a deep refuse pit producing some mixed refuse throughout the fill, decreasing in the lowest levels (Figure 14).

Feature 41: Located in Area A (N-56, E-13). Similar to Feature 39 in containing many mixed refuse type artifacts in an apparent shallow basin (Figure 17).

Feature 42: Located in Area A (N-56.5, E-13.5). This feature consisted of a concentration of naiad valves at the base of the plow zone (Figures 16 and 20). These appeared to have been stacked in groups prior to their deposition. Additional refuse materials were found below; however, the feature barely extended to the natural B Zone. It is interpreted as a shallow basin.

Feature 43: Located in Area A (N-58, E-13.5). This feature consisted of a concentration of refuse materials within the natural A Horizon. This may represent either a shallow basin pit which did not extend to the lighter B Zone, or a midden cluster.

Feature 44: Located in Area A (N-57, E-18). This was a pit feature extending well into the B Horizon. The feature contained relatively few artifacts; however, at a depth of 60-70 cm a dark organic lens containing shell and Oneota pottery sherds was encountered.

Feature 45: Located in Area A (N-49.10, E-13.10). This feature was located during excavation of Feature 18. It was not recognized until reaching the B Horizon where this pit continued to the top of the C Horizon. Feature 45 contained few artifacts.

Feature 46: Located in Area A (N-59, E-13). This feature consisted of a deep homogeneous pit which contained few artifacts (Figure 12). The homogeneity of the organically stained feature fill may represent decomposition of perishable storage items.

Feature 47: Located in Area A (N-59, E-9). Apparently an isolated midden deposit, which did not extend below the natural A Horizon.

Feature 48: Located in Trench E (N58, E1.75). This feature appears to have been either a midden concentration within the natural A Horizon, or an unidentifiable shallow basin pit.

Feature 49: Located in Trench E (N-58, W-1.5). This feature was a shallow basin containing an ash lens (Figure 15). The feature produced a large quantity of mixed refuse materials.

Feature 52: Located in Trench C (N29, E10). Excavations were only begun at this feature, with no results.

Feature 77: Located in Trench I (N119, E21.5). This feature consisted of a deep pit with few artifacts other than a concentration of naiad valves at the base of the plow zone. The absence of refuse artifacts in the fill is similar to Feature 46.



Figure 20: Stacked shell at top of Feature 42

## Lithics

Excluding hundreds of fragments of fire-cracked rock, a total of 1790 lithic artifacts were recovered during the Pammel Creek Site investigations. These include a wide variety of tools and debitage (Table 1). Appendix A includes the lithic materials recovered from each provenience unit.

The projectile points include 6 small triangular specimens (Figure 21). Triangular points are usually attributed to prehistoric cultures after about A.D. 700, and are thought to represent the introduction of bow and arrow technology (Benn 1979). These points are common at Oneota sites, although they were also manufactured by late prehistoric Woodland groups.

Two non-triangular points from the site include a Durst Stemmed point and the base of a side or corner-notched point. Durst Stemmed points are commonly attributed to Late Archaic groups (Wittry 1959). The example from 47Lc61 is missing the tip; however, the broken top appears to have been retouched into a graver-like implement. While this point may indicate the presence of an earlier Late Archaic component, it is also possible that the point was brought to the site and reworked by an Oneota occupant. The basal fragment of the side or corner-notched point is too incomplete to compare to known projectile point types, but it is unlikely that it was manufactured during the Oneota occupation.

The other lithic tools are undiagnostic of cultural affiliation; however, all are common at Oneota sites in the La Crosse region. The end scrapers (Figure 21), and the sandstone abraders in particular, are typical of those recovered at other La Crosse area Oneota sites. The range of lithic tool types indicates a wide variety of activities at the Pammel Creek Site.

Table 2 presents the results of a source material analysis of the lithic tools recovered at 47Lc61. With the exception of silicified sandstone, which is available both locally and to the north, the sources of all of the identified non-local materials is to the south of La Crosse. These could all be obtained through travel or trade along the Mississippi River. Galena and Silurian cherts outcrop as near as Prairie du Chien, Wisconsin, and extend to northern Illinois. Moline and Burlington cherts, however, would have originated further south, such as at the mouth of the Rock River in Illinois (Birmingham and Van Dyke 1981), or east central and southern Iowa.

It is interesting that no examples of a fine grey chert, which has been tentatively identified as originating from the Grand Meadow quarry in southeast Minnesota (Trow 1981), were identified in this analysis. At Oneota sites to the north of the La Crosse River (particularly at the Olson Site), this material is usually present in both tools and debitage.

Table 1: Lithic materials recovered from 47Lc61.

Lithic Tools

- 8 projectile points
- 4 knives
- 5 drill/perforators
- 17 end scrapers
- 4 side scrapers
- 75 retouched flakes
- 2 notched flakes
- 12 utilized flakes
- 2 worn flakes
- 27 biface tool fragments
- 5 hammerstones
- 7 abraders
- 1 groundstone

Lithic Reduction Categories

- 20 cores
- 9 bipolar cores
- 1 stage 1 biface
- 3 stage 2 bifaces
- stage 3 bifaces (see knives)
- 3 stage 4 bifaces
- stage 5 bifaces (see projectile points)
- stage 6 bifaces (see biface tool fragments)
- 17 primary flakes
- 28 secondary flakes
- 317 tertiary flakes
- 786 chips
- 60 shatter

Miscellaneous

- 511.6 kg. fire-cracked rock
- 379 miscellaneous rock



SIDE OR CORNER-NOTCHED

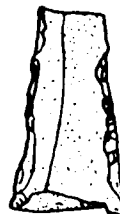
DURST STEMMED



TRIANGULAR POINTS



END SCRAPERS



DRILLS PERFORATORS

Figure 21: Lithic tools recovered at 47Lc61 (actual size).



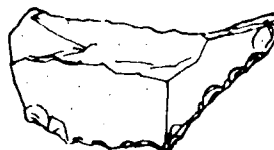
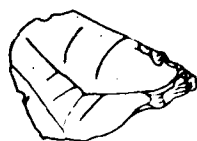
Knife



Stage 2 Bifaces (Preforms)



Bipolar Cores



Retouched Flakes



Utilized Flakes

Figure 2/3: Lithic artifacts recovered from Site 1 (actual size)

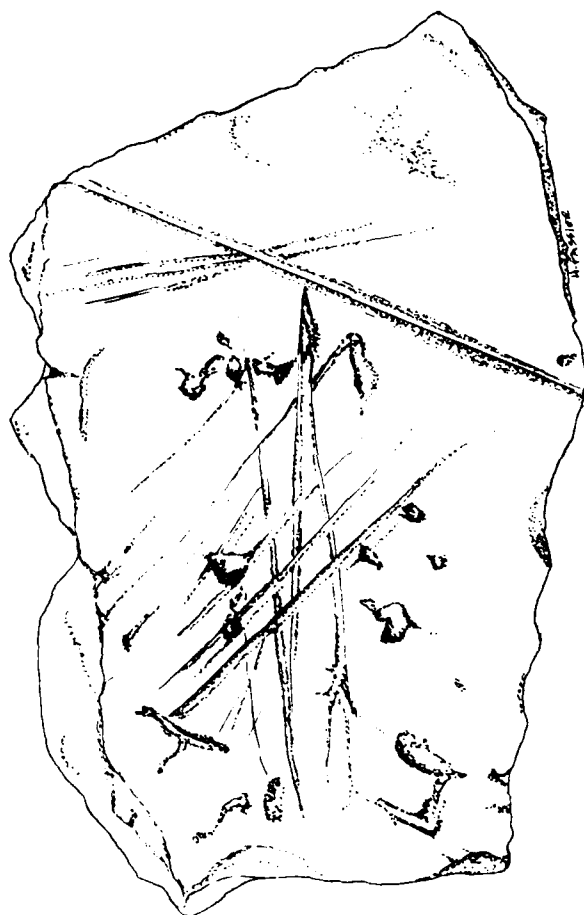


Figure 23: Abrader stone (Actual size)



Provenience	Local Chert	Silicified Sandstone	Galena	Burlington	Moline	Silurian	Others
Surface	39	5	16	9	-	2	13
F- 2	5	-	3	2	-	-	2
F- 7	1	-	2	3	-	-	1
F- 9	-	-	2	-	-	-	3
F-10	-	-	-	-	-	-	2
F-11	-	-	-	-	-	-	1
F-13	-	-	2	-	-	-	2
F-16	-	-	2	1	-	-	1
F-18	1	-	-	1	-	-	1
F-21	1	-	-	-	-	-	-
F-22	-	-	-	1	-	-	-
F-24	-	-	1	-	-	-	1
F-26	2	-	2	1	-	1	2
F-28	-	-	-	-	-	-	1
F-29	-	-	1	-	-	-	-
F-30	1	-	-	-	-	-	-
F-39	1	-	-	-	-	-	-
F-40	2	-	1	-	1	-	1
F-42	-	-	1	-	-	-	-
F-44	-	-	1	-	-	-	2
F-49	-	-	1	-	-	-	-
Total:	53	5	35	18	1	3	33
%	35.8	3.4	23.6	12.2	0.68	2.03	22.3

TABLE 2: Source materials of Lithic Tools Recovered at 47lc61.

## Ceramics

A total of 1868 ceramic sherds were recovered during excavations at the Pammel Creek Site. Of these, all but one are shell-tempered and indicative of Oneota manufacture. The one non-shell-tempered sherd is an exfoliated grit tempered rim sherd, which would traditionally be attributed to a prehistoric Woodland cultural group. However, the presence of a single grit tempered sherd at a site which produced a large sample of Oneota pottery does not necessarily imply a Woodland component at the site. Due to its condition, this sherd cannot be compared to recognized Woodland ceramic types. Virtually all of the Oneota sites in the La Crosse area have produced some "Woodland" sherds. Some of these are diagnostic of actual Woodland occupations, but often, such as at Pammel Creek, the grit tempered sherds are anomalous, and their presence is unexplained.

Of the shell-tempered Oneota sherds, 218 are decorated, including 41 rims and 7 handles. Five of the rim sherds also once had handles attached. The decorated Oneota sherds were sorted into various categories to allow comparison to five other La Crosse area Oneota sites (Stevenson, Boszhardt, and Gallagher 1983).

The previous study found wide variability both within and between ceramic assemblages from these five sites. Similarities to vessels from the Orr Phase heartland in the Upper Iowa River Valley and to those recognized as Blue Earth Phase were noted, in addition to unique vessel forms and decorative styles. The ceramics from two sites were found to have the greatest dissimilarity (Table 3). The Jim Braun Site (47Lc59) produced ceramics with some Blue Earth traits. These ceramics have sharply everted rims with interior lip decoration, and punctations forming borders along trailed or plain zones. Ceramics from the Valley View Site (47Lc34) primarily have straight or only slightly everted rims with decoration applied to the top of the lip. At Valley View, punctates were found to fill zones, rather than border them. In general, the Valley View ceramics were seen as most similar to the widely variable Orr Phase type Allamakee Trailed (Wedel 1959).

The three other Oneota ceramic assemblages from La Crosse were found to contain varying mixtures of Blue Earth-like and Orr-like traits. The Olson Site assemblage (47Lc76) was most like the Jim Braun Site assemblage, suggesting Blue Earth relations or influence. The Sand Lake Site (47Lc44) produced ceramics comparable to the Orr-like Valley View assemblage. The Overhead Site (47Lc20) showed a mixture of Blue Earth and Orr Phase ceramic attributes, and produced several vessels with little or no neck constriction; a vessel form not recognized at any other La Crosse area Oneota sites.

The Oneota ceramics from the Pammel Creek Site also show wide variation in vessel form and decorative style. Figures 24 - 30 illustrate a sample of the decorated Oneota ceramics from this site. Unfortunately, no large vessel portions were recovered, and only a few sherds include portions of rim, neck and shoulder. Therefore, identifying patterns of vessel trait combinations within this sample is problematic.

The decorated sherds from each feature were sorted into categories, allowing basic analysis of traits (Table 4). Based on a preponderance of lip

	JIM BRAUN (47Lc59)		VALLEY VIEW (47Lc34)		PAMMEL CREEK (47Lc61)	
	#	%	#	%	#	%
<u>Rim Treatment</u>						
Plain	8	9.5	7	2.6	0	0
Lip or Edge	8	9.5	249	93.6	27	61.3
Interior	67	79.8	8	3.0	9	20.5
Exterior	<u>1</u>	<u>1.2</u>	<u>2</u>	<u>0.8</u>	<u>8</u>	<u>18.2</u>
Total	84	100.0	266	100.0	44	100.0
<u>Handles</u>						
Loop	2	16.7	3	3.9	4	30.8
Strap	<u>10</u>	<u>83.3</u>	<u>73</u>	<u>96.1</u>	<u>9</u>	<u>69.2</u>
Total	12	100.0	76	100.0	13	100.0
<u>Shoulder Decoration</u>						
Plain	0	0	4	0.4	0	0
Finger Trail	12	4.5	75	7.6	16	9.6
Tool Trail	222	82.8	829	83.7	137	82.5
Punctates	<u>34</u>	<u>12.7</u>	<u>82</u>	<u>8.3</u>	<u>13</u>	<u>7.8</u>
Total	268	100.0	990	100.0	166	100.0
<u>Punctates</u>						
Bordering Trail Zones	31	91.2	3	3.6	1	7.6
Filling Zones	2	5.9	25	30.0	0	0
Rows Outlined by Trails	0	0	0	0	3	23.0
?	<u>1</u>	<u>1.9</u>	<u>54</u>	<u>65.9</u>	<u>9</u>	<u>69.2</u>

TABLE 3: Comparative Frequencies of Ceramics from Three La Crosse Area Oneota Sites including the Pammel Creek Site assemblage.

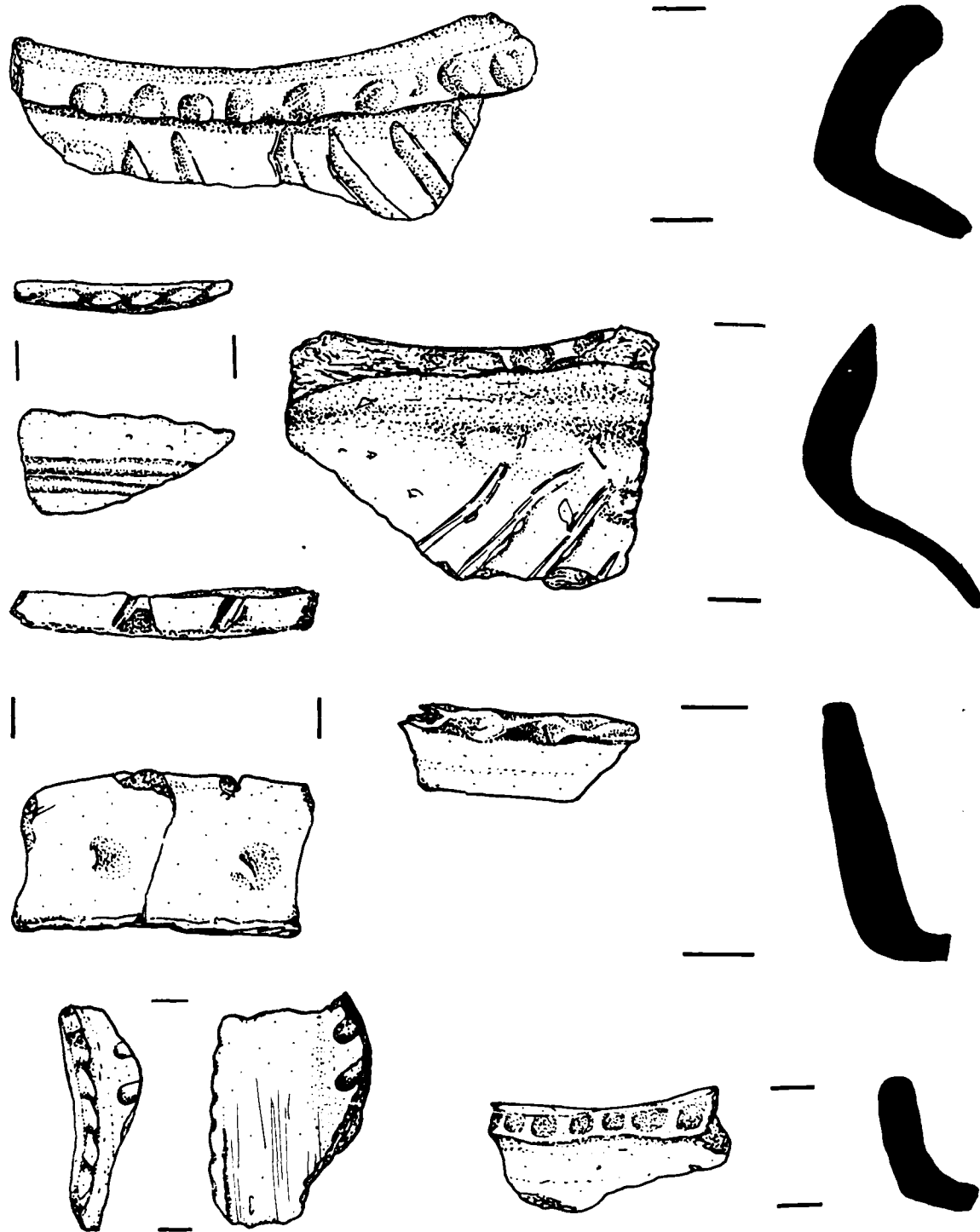


Figure 24: Oneota rim sherds with decoration on the lip top (Actual size).

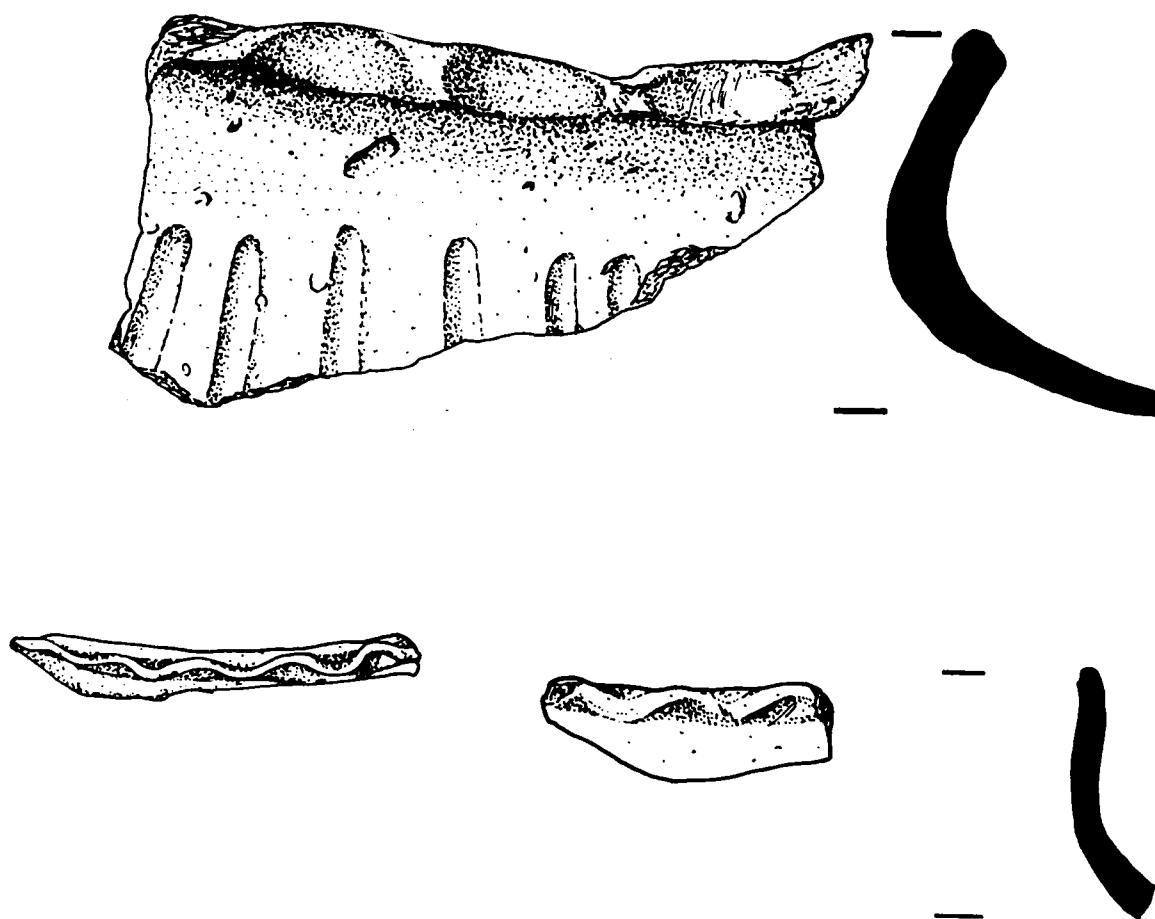


Figure 25: Oneota rim sherds with the decoration on the lip top (Actual size).

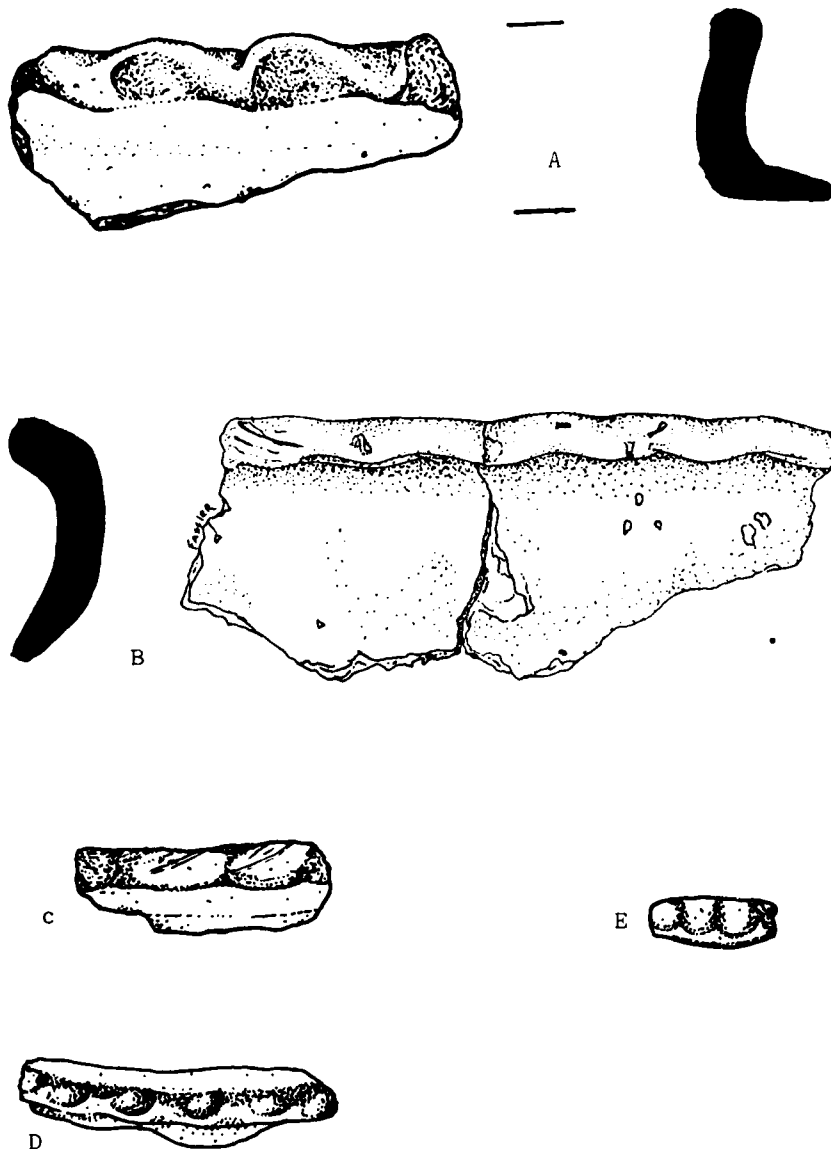


Figure 26: Oneota rim sherds A&B: decoration on the exterior edge of the lip, C-E: decoration on the interior edge of the lip (Actual size).

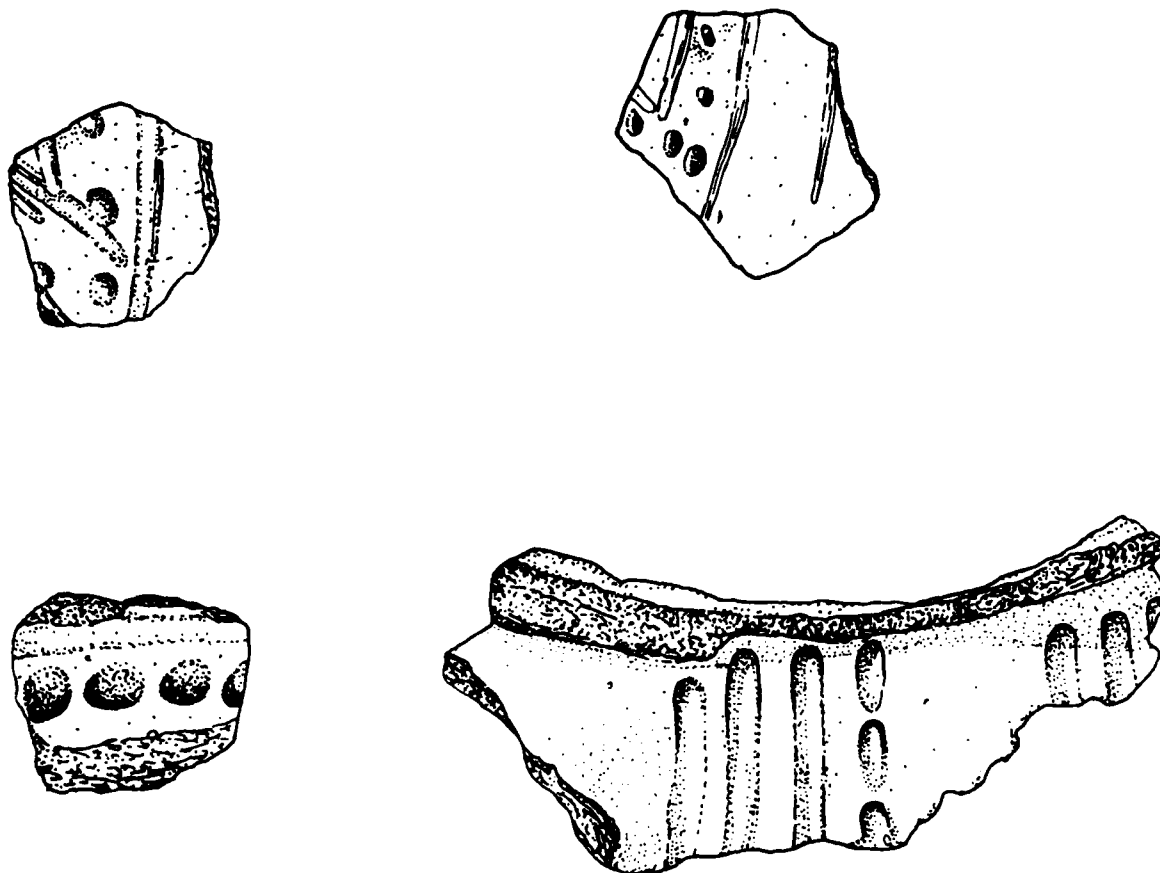


Figure 27: Oneota sherds with punctate decorations (Actual size).

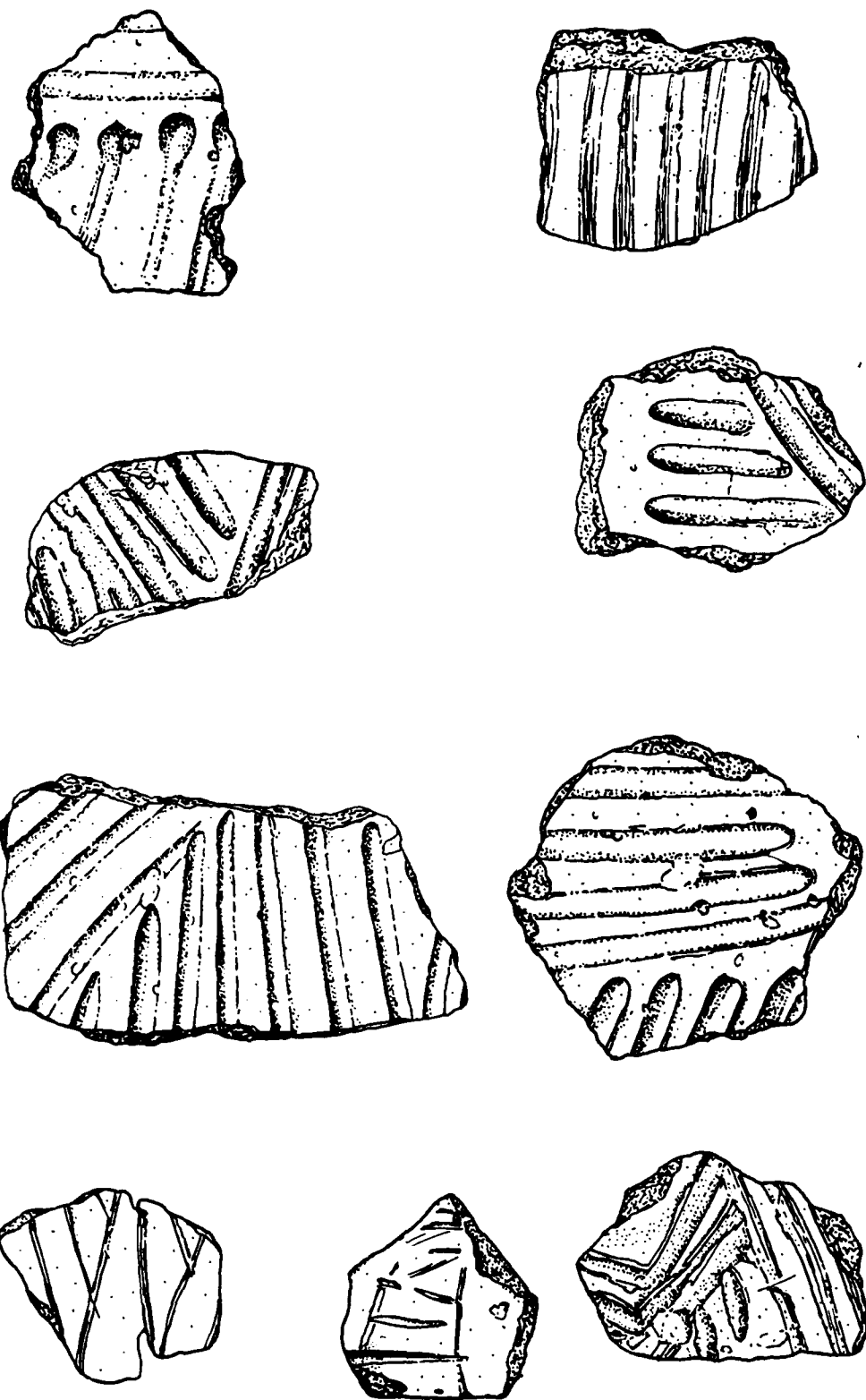


Figure 28: Oneota sherds with tool trail decorations (Actual size).



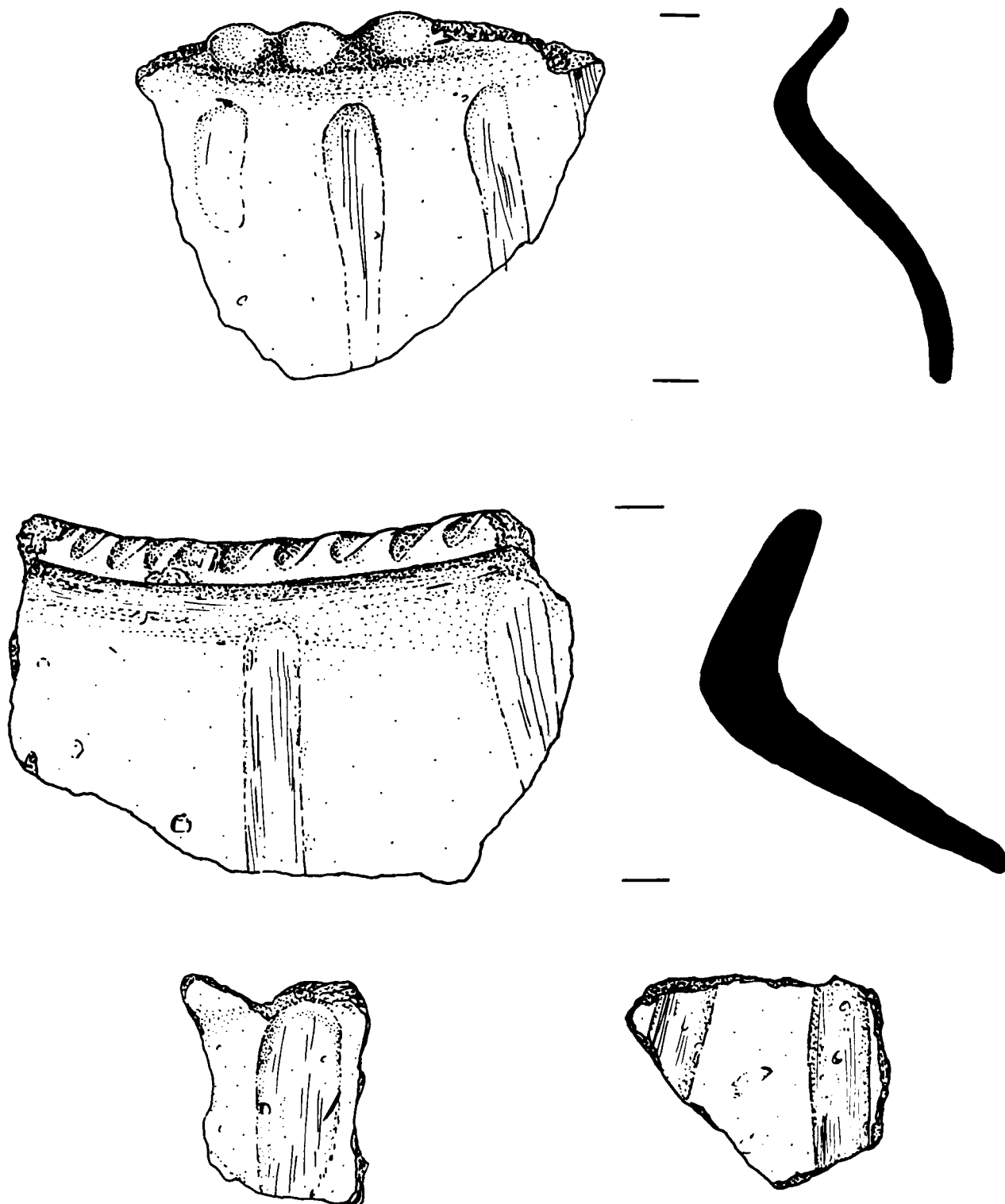


Figure 29: Oneota sherds with finger trail decorations (Actual size).

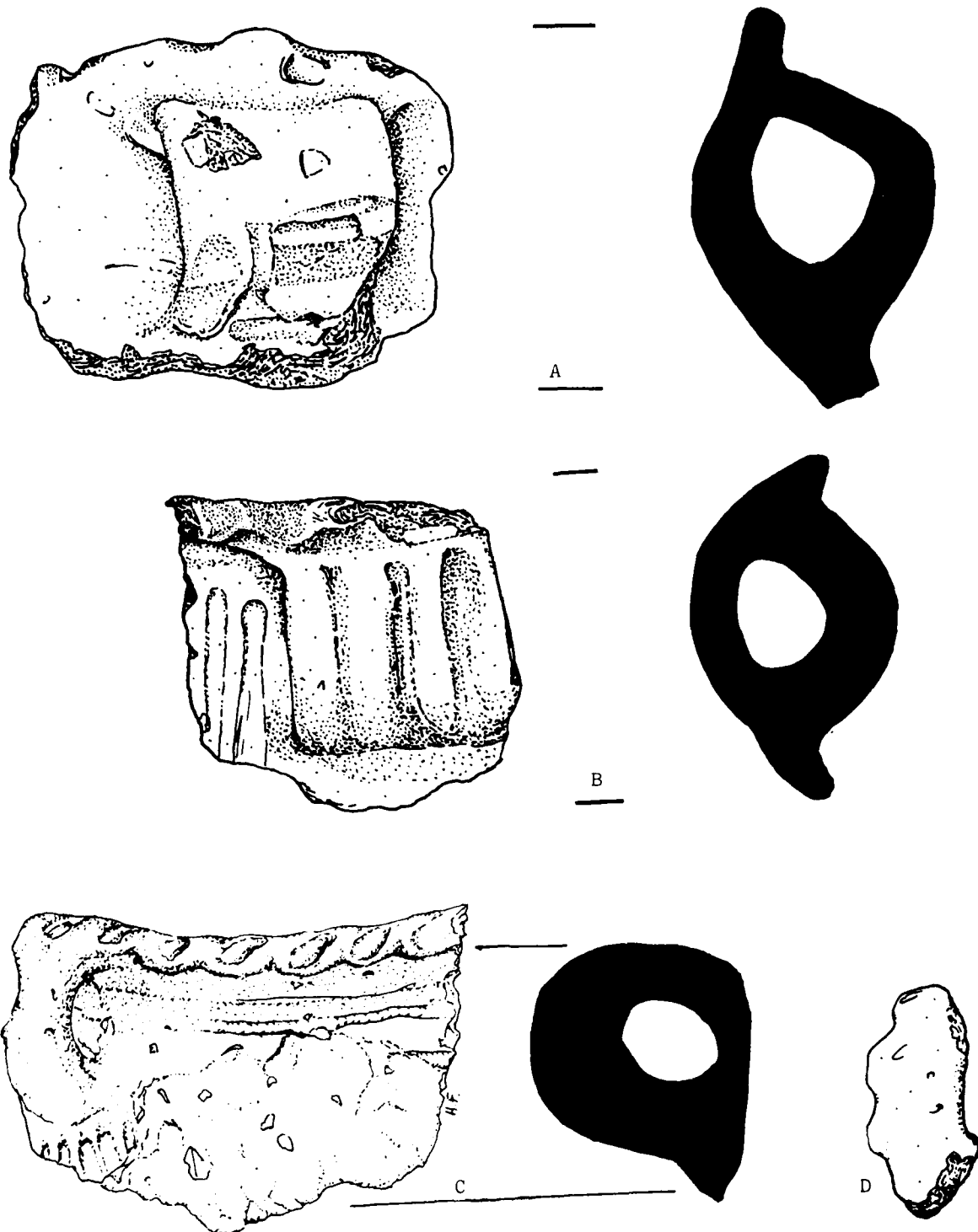


Figure 30: Oneota rim sherds with handles A&B: strap, C&D loop (Actual size).

Fea.	Lip or Edge (Tool)	Lip or Edge (Finger)	Interior	Exterior	Tool Trailed	Finger Trailed	Punctates	Loop	Strap
	totals	totals	totals	totals	totals	totals	totals	totals	totals
1	-	-	-	-	9	-	-	-	-
2	2	1	-	-	14	-	3	-	-
3	-	-	-	-	1	-	1	-	-
4	1	-	-	-	1	-	-	-	1
5	-	1	-	-	-	-	-	-	-
7	-	2	1	-	2	-	-	1	-
9	-	-	-	2	9	-	-	-	-
10	1	-	-	-	2	-	-	-	1
11	-	1	1	-	5	1	2	1	1
13	1	-	-	1	10	-	1	1	2
16	-	-	-	1	-	-	-	-	-
17	-	-	-	-	-	1	-	-	-
18	-	-	-	-	2	-	-	-	-
22	-	-	-	-	2	-	-	-	-
24	1	-	-	-	14	-	-	-	-
26	-	-	-	-	3	5	-	-	-
28	2	-	-	1	3	1	-	-	-
29	1	-	-	-	1	-	-	-	-
35	-	-	1	1	3	-	1	-	-
37	-	-	-	-	2	1	-	-	-
39	-	1	2	-	11	-	-	-	-
40	1	-	-	-	4	-	-	-	1
41	-	-	-	2	8	2	1	-	-
42	-	-	-	-	4	1	-	-	-
44	-	-	-	-	2	-	-	-	-
46	1	-	1	-	2	2	-	-	-
49	-	-	1	-	1	-	-	-	-
52	-	-	-	-	1	-	-	-	-
96	2	-	-	-	1	-	2	-	1
99	1	2	-	-	-	-	-	-	-
120	-	-	-	-	-	-	-	-	-
Surface	4	1	2	-	16	2	1	-	2
T.P. 3	-	-	-	-	4	-	-	-	4
Total	18	9	9	8	137	16	12	4	9

TABLE 4 : Quantities of Oneota Ceramic decorative attributes per provenience at 47Le61

top decoration (Figure 24 & 25), the Pammel Creek assemblage is similar to the Orr-like Valley View and Sand Lake Site ceramics. However, some rims are decorated with notches on the interior edge of the lip (Figure 26), suggesting similarities to the Jim Braun and Olson assemblages. Extreme rim eversion, evident on many of the interior lip decorated rims from the Jim Braun and Olson Sites, is not represented in the Pammel Creek assemblage. Furthermore, decoration on the exterior edge of the lip (Figure 26) is more frequent at Pammel Creek than either Jim Braun or Valley View.

Other attributes show little difference between the Jim Braun, Valley View, and Pammel Creek assemblages, except the use of punctations. Although the number of punctated sherds from the Pammel Creek Site is few, and only four of these are complete enough to identify the decorative pattern, the style represented on all but one of these is a line of punctates outlined by parallel trails (Figure 27). This style was not found on sherds from either the Valley View or Jim Braun Sites, although this decoration has appeared on sherds recovered from the Overhead Site (Gallagher et al. 1981:Fig. 25), the State Road Coulee Site (47Lcl76; Boszhardt and Gallagher 1984), and the Bird Bluff Site (47Lcl58). The fourth punctated sherd from the Pammel Creek Site has a line of punctations between a zone of tool trails and a smooth zone, and is comparable to the Blue Earth-like Jim Braun and Olson Site assemblages. No sherds with punctates filling zones, such as were common at the Orr-like Valley View Site, were recovered from the Pammel Creek Site.

In general, the ceramics from the Pammel Creek Site suggest a mixture of traits attributed to the Blue Earth and Orr Phases. In this regard, the Pammel Creek ceramics are like that of the Oneota assemblage from the nearby Overhead Site; however, several attributes present at the Overhead site have not been recovered in the larger sample from Pammel Creek. For example, the unique straight-walled shell tempered vessels found at the Overhead are not represented in the Pammel Creek assemblage. In addition, the Overhead Site contained some sherds with the punctate-filled zones common at the Valley View Site, and sharply everted rims with distinct interior lip decorations like many from the Jim Braun Site, but such examples have not been recovered from Pammel Creek. Therefore, the Pammel Creek ceramics do not permit affiliation to either the Blue Earth or the Orr Phase.

### Faunal Remains

Identifiable remains were analyzed by James L. Theler, at the University of Wisconsin-Madison. His report is included here in its entirety. It should be noted that four bison scapulas from Feature 12 (a cache), and one from Feature 4 (a refuse pit), were not included in the materials studied by Theler. The scapulas from Feature 12 consist of two right and two left elements. Each has had the scapular spine removed, and three show wear at the distal end of the blade suggesting use as hoes. The scapula from Feature 4 is from the right side, and also has had the spine removed. Much of the blade is missing, though the proximal end of the remaining portion is worn, indicating use as a hoe or possibly as a fiber processor. When combined with the right scapula fragment identified by Theler from Feature 2, the total minimum number of bison at the site is 3 rather than 1 as listed in the following tables. As Theler notes, the absence of any other bison elements in the faunal assemblage from this site indicates that bison were not hunted locally and butchered/processed at the site. Rather, it appears that bison scapulas were obtained from non-local sources specifically for tool use.

## Faunal Remains

by James L. Theler

The remains of both vertebrate and invertebrate fauna recovered at Pammel Creek were cleaned and sorted by MVAC personnel. Those specimens believed to be identifiable to the family, genus or species level were sent to the author and are the subject of the present report.

The faunal assemblage is presented in two formats. In Table 5, I have combined the faunal material from all context for the purpose of calculating the minimum number of individuals (MNI) represented and projecting the potential yield of usable meat. The estimated usable meat provided by each taxa follows procedures I have outlined elsewhere (Theler 1983). The quantity of usable meat for freshwater mussel taxa is taken from Parmalee and Klippel (1974, Table 1:424). The usable meat from mammals is estimated to be 50% of live weight, while birds and fish were assigned a usage portion of 70% of the live weight.

In Table 6, I present the taxa and apparent MNI represented in each feature. In calculating the MNI for each feature one arrives at a much higher, and I presume inflated, MNI for the site assemblage. By way of example, 17 white-tailed deer elements were found distributed among 9 separate features and two other contexts at the site (see Table 7). One might interpret this as representing an MNI of 11 individual deer. However, when all deer elements at the site are considered as a unit, an MNI of 2 individuals is represented by right calcanea. The calculation of MNI and the projected kilograms of usable meat is a speculative matter on small samples like the one recovered at 47Lc61.

The MNI for fish is based on individual size and unique element count. Again, there is some disparity between the combined total for the site (Table 5) and the feature by feature listing (Table 6).

### Mammals

Nine mammal taxa are represented in the Pammel Creek assemblage. A mandible of a mouse (Peromyscus sp.) and a human tibia fragment are not interpreted as dietary remains. A bison is represented by a single unmodified scapula fragment. The occurrence of a cache of bison scapula hoes at Pammel Creek and the absence of other bison elements may indicate scapulae were introduced as tool blanks and are not representative of a dietary source at this site. A parallel situation with numbers of bison scapula hoes and no other bison remains has been encountered at the Orr phase Valley View Site (47Lc34) also in La Crosse County (K. Stevenson, personal communication). In Table 5, I have not assigned an estimated meat value for bison due to the uncertain origins of the unmodified scapula fragment.

An estimated 390.9 kgs of usable meat are represented by faunal remains at Pammel Creek, of which 333.9 kgs (85.4%) were provided by mammals. Most of the mammalian meat was derived from a black bear (Ursus americanus), an elk (Cervus canadensis) and 2 white-tailed deer (Odocoileus

virginianus). Two riparian taxa include a muskrat (Ondatra zibethicus) and a beaver (Castor canadensis). Seven elements appear to represent at least 2 individual canids. Three phalanges from one individual recovered in Feature 10 are well within the size range of an adult wolf (Canis lupus), while the other canid elements are within the range of a medium sized domestic dog or coyote.

### Birds

Birds contributed 4.6 kilograms of meat or 1.2% of all usable meat in the Pammel Creek sample. The majority of this meat is attributable to 3 ducks and a sandhill crane recovered in Feature 2. Prior to the turn of the last century, the sandhill crane (Grus canadensis) was "a very abundant migrant and common summer resident, from the southern border of the state of Wisconsin northward" (Kumlien and Hollister 1951:29). A common merganser (Mergus merganser) element was recovered in Feature 2. This bird was historically known as a common spring and fall migrant, but not a summer resident in west central Wisconsin.

Feature 2 at Pammel Creek is particularly interesting in that it contained several hundred bird eggshell fragments. The majority of shell fragments were recovered through water screening of feature matrix. Table 8 presents the number of eggshell fragments by screen size. The measurements of selected shell fragments found most to be either ca. .2 mm or .45 mm in thickness. This may be suggestive that eggs of two or more birds species were utilized. Bird eggshell fragments have also been recovered at the Valley View Site (K. Stevenson, personal communication).

### Turtles

Five individual aquatic turtles of at least 4 taxa were found at 47Lc61. These individuals contributed an estimated 3.9 kgs to the diet, or about 1.0% of all meat represented.

A complete carapace (upper shell) and plastron (lower shell) of a painted turtle (Chrysemys picta) were recovered in Feature 2 at Pammel Creek, and were removed as a unit with surrounding matrix. The carapace is rotated approximately 90° relative to the plastron while nearly resting on each other. Examination of the 2 bridges that join the upper and lower shell segments, finds one broken and the other separated at the connecting suture. Experimentally I have found that an effective method of preparing and opening turtles is to steam or bake the individual and then break (or saw) one bridge. This permits easy separation of upper and lower shell segments with complete access to the meaty contents of the turtle. The Pammel Creek specimen may have been opened on this manner.

### Fish

At least 28 individual fish of 10 taxa contributed some 46.3 kilograms of meat to the diet or about 11.9% of all meat represented. The species in this assemblage could be taken in quiet backwater or side channel habitats of the Mississippi flood plain during the warmer months of the year.

Most of the fish at Pammel Creek has an estimated live weight in excess of .5 kg. The sorted heavy fraction debris from 1/8" and 1/16"

waterscreened feature matrix samples contained very few elements from smaller (<.5 kg) fish. This is in some contrast to the fish assemblage at the Valley View Site, where elements of small individual fish (<.2 kg), particularly of the family Ictaluridae, were numerically dominant in some features (K. Stevenson, personal communication). Assuming the samples from Pammel Creek and the Valley View Sites are comparable, different exploitive strategies were employed at these two sites to procure fish.

#### Freshwater Mussels

Eleven freshwater mussel taxa totaling at least 68 individuals contributed about 2.2 kgs or .6% of the estimated meat of the Pammel Creek assemblage. In this portion of the upper Mississippi River valley, mussels are most easily collected during the period of warm, low water, or roughly during the months of June through September.

The numerical dominants in this assemblage, the ebony shell (Fusconaia ebena), pig-toe (F. flava), monkey face (Quadrula metanevra) and the pimple-back (Q. pustulosa) are species normally associated with a sand and/or gravel substrate and a moderate to strong water current. The taxa usually found in quieter waters and/or on a soft or shifting substrate (Anodonta sp.) are rare in this assemblage.

#### Conclusions

The species content of the Pammel Creek faunal assemblage indicates a variety of resource zones were exploited. A range of aquatic and riparian animals were harvested from active river channels, quiet backwaters and marsh habitats. However, most of the usable meat is attributable to a small number of large terrestrial mammals. As I have previously discussed, the projection of MNI and kilograms of usable meat remains a speculative pursuit. It is perhaps the case that certain resources such as fish and freshwater mussels were relatively more important, at least seasonally, than large mammals in the diet.

In addition to a wide range of bird, turtle, fish and freshwater mussel taxa, Feature 2 at 47Lc61 also contained several hundred bird eggshell fragments. This feature appears to have been filled with refuse generated from spring and/or summer subsistence activities. The faunal material in Features 9 and 13 also may represent summer resource procurement. A more precise understanding of the origins and depositional history of feature fill may be achieved through comparing the faunal assemblage with the floral and artifactual remains for each feature.



Table 5. Summary of Identified Faunal Remains from the Pammel Creek Site (47LC61),  
La Crosse County, Wisconsin

	<u>Number of Elements/ Fragments</u>	<u>Estimated Minimum Number of Individuals</u>	<u>Kilograms of Usable Meat</u>	<u>%</u>
<b>Mammals</b>				
<u>Geomys bursarius</u> (pocket gopher)	2	1	.1	
<u>Castor canadensis</u> (beaver)	8	1	11.0	
<u>Peromyscus sp.</u> (white-footed or deer mouse)	1	1	*	
<u>Ondatra zibethicus</u> (muskrat)	1	1	.6	
<u>Canidae</u> (wolf/coyote/dog)	8	2	9.0	
<u>Ursus americanus</u> (black bear)	1	1	78.0	
<u>Cervus canadensis</u> (elk)	1	1	158.0	
<u>Odocoileus virginianus</u> (white-tailed deer)	17	2	77.2	
<u>Bison bison</u> (buffalo)	1	1	-	
<u>Homo s. sapiens</u> (man)	1	1	*	
Subtotal	41	12	333.9	85.4
<b>Birds</b>				
<u>Anas cf. platyrhynchos</u> (mallard)	1	1	.8	
<u>Anas carolinensis/discors</u> (green or blue winged teal)	1	1	.2	
<u>Mergus merganser</u> (common merganser)	1	1	1.0	

\* = not considered a food item

Table 5 (continued): Parmel Creek Faunal Remains

	<u>Number of Elements/ Fragments</u>	<u>Estimated Minimum Number of Individuals</u>	<u>Kilograms of usable Meat</u>	<u>%</u>
Birds (continued)				
<u>Grus canadensis</u> (sandhill crane)	2	1	2.2	
Large duck/goose sized bird)	1	-	-	
Medium sized duck	4	-	-	
Small duck	2	-	-	
Medium sized bird	1	1	.4	
Passeriformes (small perching birds)	3	1	*	
Egg shell fragments	678	?	?	
Subtotal	694	7	4.6	1.18
Turtles				
<u>Chelydra serpentina</u> (snapping turtle)	1	1	2.3	
<u>Chrysemys picta</u> (painted turtle)	2	2	.2	
cf. <u>C. picta</u>	6	-	-	
<u>Graptemys</u> sp. (map turtle)	1	1	.5	
<u>Chrysemys/Graptemys</u>	3	-	-	
<u>Trionyx</u> sp. (softshell turtle)	3	1	.9	
Turtle spp.	3	-	-	
Subtotal	19	5	3.9	1.0

Table 5 (continued): Pammel Creek Faunal Remains

Fishes	Number of Elements/ <u>Fragments</u>	Estimated Minimum Number of <u>Individuals</u>	Kilograms of Usable <u>Meat</u>	<u>%</u>
<u>Lepisosteus</u> sp. (gar)	17	1	.4	
<u>Amia calva</u> (bowfin)	11	4	3.2	
<u>Esox</u> sp. (pike)	2	2	4.9	
<u>Ictiobus bubalus</u> (smallmouth buffalo)	1	1	4.8	
<u>Ictiobus</u> sp. (buffalo)	2	1	7.9	
<u>Moxostoma</u> sp. (redhorse sucker)	1	1	.6	
<u>Catostomidae</u> (sucker)	1	-	-	
<u>Ictalurus punctatus</u> (channel catfish)	8	4	6.1	
<u>Ictalurus</u> sp. (bullhead catfish)	14	4	.8	
<u>Ictaluridae</u> (catfishes)	15	-	-	
<u>Pomoxis nigromaculatus</u> (black crappie)	4	2	1.0	
<u>Stizostedion</u> cf. <u>vitreum</u> (walleye)	7	1	1.3	
<u>Aplodinotus grunniens</u> (freshwater drumfish)	39	7	15.3	
Subtotal	123	28	46.3	11.85

Table 1 (continued): Pammel Creek Faunal Remains

	Number of Elements/ Fragments	Estimated Minimum Number of Individuals	Kilograms of Usable Meat	%
Freshwater Mussels				
<u>Anodonta grandis</u> (floater)	1	1	.09	
<u>Quadrula metanevra</u> (Raf., 1820)	13	8	.18	
(monkey face)				
<u>Quadrula p. pustulosa</u> (Lea, 1831)	16	8	.14	
(pimple-back)				
<u>Ambleria p. plicata</u> (Say, 1817 )	9	7	.29	
(three-ridge)				
<u>Fusconaia ebena</u> (Lea, 1831)	47	26	.75	
(ebony shell)				
<u>Fusconaia flava</u> (Raf., 1820)	17	11	.21	
(pig-toe)				
<u>Pleurobema sintoxia</u> (Raf., 1820)	14	7	.20	
(round pig-toe)				
<u>Plagiola lineolata</u> (Raf., 1820)	1	1	.02	
(butterfly)				
<u>Obovaria olivaria</u> (Raf., 1820)	2	1	.01	
(hickory-nut)				
<u>Potamilus alatus</u> (Say, 1817)	1	1	.06	
(pink hell-splitter)				
<u>Lampsilis ventricosa</u> (Barnes, 1823)	1	1	.08	
(pocketbook)				
<u>Lampsilis</u> sp.	6	3	.15	
Unidentifiable valves	70	-	-	
Subtotal	198	68	2.18	.56
Terrestrial Gastropods				
<u>Zonitoides arboreus</u> (Say)	1	1	*	
<u>Helicodiscus parallelus</u> (Say)	6	6	*	
Aquatic/Amphibian Gastropods	4	4	*	

Table 6: Distribution by Feature of Faunal Remains at 47LC61

<u>Feature 2</u>	<u>Number of Elements</u>	<u>MNI</u>	
<b>Mammals</b>			
<u>Geomys bursarius</u>	2	1	
<u>Castor canadensis</u>	3	1	
<u>Peromyscus</u> sp.	1	1	
<u>Odocolleus virginianus</u>	1	1	
<u>Bison bison</u>	1	1	
<b>Birds</b>			
<u>Anas</u> cf. <u>platyrhynchos</u>	1	1	
<u>Anas carolinensis/discors</u>	1	1	
<u>Mergus merganser</u>	1	1	
<u>Grus canadensis</u>	2	1	
Large duck/goose sized bird	1	-	
Medium sized duck	4	-	
Small duck	2	-	
Bird eggshell fragments	671*	?	
<b>Turtles</b>			
<u>Chrysemys picta</u>	1	1	
cf. <u>Chrysemys picta</u>	6	2	
<u>Graptemys</u> sp.	1	1	
<u>Chrysemys/Graptemys</u> sp.	1	-	
Small turtle sp.	2	-	
<b>Fishes</b>			
			<u>Estimated Total Live Weight(kg)</u>
<u>Lepisosteus</u> sp.	3	1	.5
<u>Amia calva</u>	1	1	-
<u>Esox</u> sp.	1	1	.2
<u>Ictiobus</u> sp.	2	1	11.3
<u>Ictalurus punctatus</u>	4	2	2.3
<u>Ictaluridae</u>	4	2	.6
<u>Pomoxis nigromaculatus</u>	2	1	.7
<u>Aplodinotus grunniens</u>	23	2	2.5
<b>Freshwater Mussels</b>			
<u>Anodonta grandis</u> sp.	1	1	
<u>Quadrula metanevra</u>	1	1	
<u>Amblema p. plicata</u>	2	2	
<u>Fusconaia flava</u>	3	2	

\* = see Table 8 for distribution

Table 6 (continued): 47LC61 Faunal Remains by Feature

	Number of <u>Elements</u>	<u>MNI</u>	
<u>F.2 (cont.) - Freshwater Mussels (cont.)</u>			
<u>Pleurobema sintoxia</u>	1	1	
<u>Obovaria olivaria</u>	1	1	
<u>Potamilus alatus</u>	1	1	
<u>Lampsilis</u> sp.	4	3	
Unidentifiable valves	7	-	
Terrestrial Gastropods			
<u>Zonitoides arboreus</u>	1	1	
<u>Helicodiscus parallelus</u>	6	6	
Aquatic/Amphib. Gastropods	4	4	
<u>Feature 3</u>			
Fishes			<u>Estimated Total Live Weight(kg)</u>
<u>Amia calva</u>	1	1	2.3
<u>Ictaluridae</u>	2	1	.9
<u>Feature 4</u>			
Freshwater Mussels			
<u>Quadrula metanevra</u>	1	1	
<u>Pleurobema sintoxia</u>	1	1	
Unidentifiable valves	3	-	
<u>Feature 5</u>			
Freshwater Mussels			
<u>Quadrula metanevra</u>	1	1	
Unidentifiable valves	1	-	

Table 6 (continued): 47LC61 Faunal Remains by Feature

<u>Feature 7</u>	<u>Number of Elements</u>	<u>MNI</u>	
Mammals			
<u>Odocoileus virginianus</u>	1	1	
Turtles			
<u>Chrysemys/Graptemys</u>	1	1	
Fishes			<u>Estimated Total Live Weight(kg)</u>
<u>Ictiobus bubalus</u>	1	1	6.8
<u>Ictaluridae</u>	2	1	.5
<u>Aplodinotus grunniens</u>	1*	1	-
Freshwater Mussels			
<u>Amblema p. plicata</u>	1	1	
<u>Fusconaia ebena</u>	3	2	
Unidentifiable valves	4	-	
 <u>Feature 9</u>			
Mammals			
<u>Castor canadensis</u>	2	1	
<u>Ondatra zibethicus</u>	1	1	
<u>Odocoileus virginianus</u>	5	1	
Birds			
Small bird	1	1	
Eggshell fragments	2	-	
Turtles			
cf. <u>Chrysemys picta</u>	1	1	
Turtle sp.	1	1	

\* = isolated arch tooth

Table 6 (continued): 47LC61 Faunal Remains by Feature

	Number of <u>Elements</u>	<u>MNI</u>	Estimated Total <u>Live Weight(kg)</u>
<u>F.9 (cont.)</u>			
Fishes			
<u>Lepisosteus</u> sp.	5	1	.5
<u>Amia calva</u>	3	-	-
Catostomidae	1	-	-
<u>Ictalurus punctatus</u>	1	1	4.5
<u>Ictalurus</u> sp.	1	1	.1
Ictaluridae	3	1	.2
<u>Pomoxis</u> cf. <u>nigromaculatus</u>	2	1	.7
<u>Stizostedion</u> cf. <u>vitreum</u>	7	1	1.8
<u>Aplodinotus grunniens</u>	5	3	10.7
Freshwater Mussels			
<u>Quadrula metanevra</u>	1	1	
<u>Quadrula</u> p. <u>pustulosa</u>	2	1	
<u>Amblema</u> p. <u>plicata</u>	2	1	
<u>Fusconaia flava</u>	1	1	
<u>Lampsilis</u> sp.	1	1	
<u>Feature 10</u>			
Mammals			
Canidae	3	1	
Turtles			
<u>Trionyx</u> sp.	2	1	
Freshwater Mussels			
<u>Pleurobema sintoxia</u>	1	1	
Unidentifiable valve	1	-	
<u>Feature 11</u>			
Mammals			
Canidae	1	1	
<u>Homo s. sapiens</u>	1	1	



Table 6 (continued); 47LC61 Faunal Remains by Feature

	Number of <u>Elements</u>	<u>MNI</u>	
<u>F.11 (cont.)</u>			
Fishes			Estimated Total Live Weight(kg)
<u>Amia calva</u>	3	2	2.1
Freshwater Mussels			
<u>Amblema p. plicata</u>	1	1	
<u>Obovaria olivaria</u>	1	1	
Unidentifiable valves	6	-	
 <u>Feature 13</u>			
Mammals			
<u>Castor canadensis</u>	1	1	
<u>Canidae</u>	1	1	
<u>Odocoileus virginianus</u>	2	1	
Birds			
Medium sized duck	1	1	
Turtles			
<u>Chelydra serpentina</u>	1	1	
<u>Trionyx sp.</u>	1	1	
Fishes			Estimated Total Live Weight(kg)
<u>Lepisosteus sp.</u>	1	1	.5
<u>Amia calva</u>	3	2	2.5
<u>Moxostoma sp.</u>	1	1	.9
<u>Ictalurus punctatus</u>	3	2	2.8
<u>Ictaluridae</u>	2	-	-
<u>Ictalurus sp.</u>	10	3	.6
<u>Aplodinotus grunniens</u>	2	1	.7
Freshwater Mussels			
<u>Quadrula p. pustulosa</u>	2	2	
<u>Amblema p. plicata</u>	1	1	
<u>Fusconaia ebena</u>	4	2	
<u>Fusconaia flava</u>	2	1	
<u>Lampsilis ventricosa</u>	1	1	
Unidentifiable valves	2	0	

Table 6 (continued): 47LC61 Faunal Remains by Feature

	Number of <u>Elements</u>	<u>MNI</u>	
<u>Feature 18</u>			
Mammals			
Canidae	2	1	
<u>Odocoileus virginianus</u>	1	1	
Freshwater Mussels			
<u>Fusconaia ebena</u>	2	2	
Unidentifiable valves	1	-	
<u>Feature 24</u>			
Freshwater Mussels			
<u>Fusconaia flava</u>	1	1	
<u>Feature 26</u>			
Mammals			
<u>Cervus canadensis</u>	1	1	
Fishes			Estimated Total
<u>Aplodinotus grunniens</u>	3	1	<u>Live Weight(kg)</u>
			-
Freshwater Mussels			
Unidentifiable valve	1	-	
<u>Feature 31</u>			
Freshwater Mussels			
<u>Quadrula metanevra</u>	1	1	
<u>Fusconaia flava</u>	1	1	

Table 6 (continued): 47LC61 Faunal Remains by Feature

	Number of <u>Elements</u>	<u>MNI</u>	
<u>Feature 33</u>			
Mammals			
<u>Odocoileus virginianus</u>	1	1	
<u>Feature 35</u>			
Fishes			<u>Estimated Total Live Weight(kg)</u>
<u>Aplodinotus grunniens</u>	1	1	.5
Freshwater Mussels			
<u>Quadrula p. pustulosa</u>	1	1	
<u>Fusconaia ebena</u>	1	1	
<u>Fusconaia flava</u>	1	1	
<u>Pleurobema sintoxia</u>	1	1	
<u>Lampsilis sp.</u>	1	1	
Unidentifiable valve	1	-	
<u>Feature 39</u>			
Mammals			
<u>Castor canadensis</u>	1	1	
Fishes			<u>Estimated Total Live Weight(kg)</u>
<u>Lepisosteus sp.</u>	1	1	-
<u>Esox sp.</u>	1	1	6.8
<u>Aplodinotus grunniens</u>	1	1	.9
Freshwater Mussels			
Unidentifiable valves	4	-	

Table 6 (continued): 47LC61 Faunal Remains by Feature

	Number of <u>Elements</u>	<u>MNI</u>	
<u>Feature 40</u>			
Mammals			
<u>Odocoileus virginianus</u>	1	1	
Freshwater Mussels			
<u>Fusconaia ebena</u>	1	1	
Unidentifiable valves	2	-	
<u>Feature 42</u>			
Turtles			
<u>Chrysemys/Graptemys</u>	1	1	
Fishes			<u>Estimated Total Live Weight(kg)</u>
<u>Lepisosteus</u> sp.	1	1	-
<u>Ictalurus</u> sp.	2	1	.1
<u>Ictaluridae</u>	1	1	-
<u>Aplodinotus grunniens</u>	3	1	9.1
Freshwater Mussels			
<u>Fusconaia ebena</u>	1	1	
<u>Fusconaia flava</u>	1	1	
Unidentifiable valves	4	-	
<u>Feature 44</u>			
Freshwater Mussels			
Unidentifiable valves	2	-	
<u>Feature 46</u>			
Mammal			
<u>Odocoileus virginianus</u>	1	1	

Table 6 (continued): 47LC61 Faunal Remains by Feature

	Number of <u>Elements</u>	<u>MNI</u>	
<u>Feature 49</u>			
Mammal			
<u>Odocoileus virginianus</u>	1	1	
Fishes			
			Estimated Total Live Weight(kg)
<u>Lepisosteus</u> sp.	6	1	-
<u>Ictalurus</u> sp.	1	1	-
<u>Ictaluridae</u>	1	1	.2
Freshwater Mussels			
<u>Fusconaia ebena</u>	3	3	
<u>Feature 77</u>			
Freshwater Mussels			
<u>Quadrula metanevra</u>	8	4	
<u>Quadrula p. pustulosa</u>	11	6	
<u>Amblema p. plicata</u>	2	2	
<u>Fusconaia ebena</u>	32	19	
<u>Fusconaia flava</u>	7	6	
<u>Pleurobema sintoxia</u>	10	6	
<u>Plagiola lineolata</u>	1	1	
Unidentifiable valves	29	-	

Table 7: Distribution of Mammal and Bird Elements at 47LC61

<u>Mammals</u>	<u>No.</u>	<u>Element</u>	<u>Side</u>	<u>Burned/ Non-burned</u>	<u>Provenience Feature/Level</u>
<u>Geomys bursarius</u>	1	mandible	Rt.	NB	F.2,L-8
	1	distal humerus	Rt.	NB	F.2,L-8
<u>Castor canadensis</u>	1	incisor fragment	-	NB	F.2,L-8
	1	ischium	Lt.	NB	F.2,L-8
	1	medial fibula	Rt.	NB	F.2,L-9
	1	zygomatic	Rt.	B	F.9,L-1
	1	mandibular condyle	Rt.	B	F.9,L-1
	1	zygomatic	Lt.	NB	F.13,L-2
	1	mandible w/p4,m1,m2,m3 (incisor removed)	Lt.	NB	F.39,L-2
	1	innominate (rodent gnawed)	Rt.	NB	83.252 (F.13, profile)
<u>Peromyscus sp.</u>	1	mandible w/full dentition	Lt.	NB	F.2,L-8
<u>Ondatra zibethicus</u>	1	m1	Rt.	NB	F.9,L-1 & 2
<u>Canidae</u>	3	phalanges	-	NB	F.10,L-1
	1	m1 (crown)	Rt.	NB	F.11,L-1
	1	mandible w/p3, p4, m1	Lt.	NB	F.13,L-5
	1	astragalus	Lt.	B	F.18,L-3
	1	calcaneum	Lt.	B	F.18,L-3
<u>Ursus americanus</u>	1	maxilla w/m2,m1	Rt.	NB	Area A (disturbed)
<u>Cervus canadensis</u>	1	proximal 2nd phalanx	-	NB	F.26,L-4
<u>Odocoileus virginianus</u>	1	proximal 1st phalanx	-	NB	F.2,L-4
	1	astragalus	Lt.	NB	F.2,L-7
	1	maxilla w/m1,m2m3	Lt.	NB	F.9,L-1
	1	calcaneum	Lt.	NB	F.9,L-1

Table 7 (continued): Elements at 47LC61

<u>Mammals (cont.)</u>	<u>Element</u>	<u>Side</u>	<u>Burned/ Non-burned</u>	<u>Provenience Feature/Level</u>
<u>O. virginianus</u> (cont.)				
1	mandible (cut mark on lateral face)	Rt.	NB	F.9,L-1
1	distal 1st phalanx	-	NB	F.9,L-5
1	ascending ramus of mandible	Rt.	NB	F.9,profile
1	molars (very worn)	-	NB	F.13,L-1
1	p2	Rt.	NB	F.18,L-1
1	mandible section w/p3, p4,m1	Lt.	NB	F.33,L-2
1	proximal radius	Lt.	NB	F.40,L-6
1	internal acoustic meatus	Rt.	NB	F.46,L-4
1	distal 1st phalanx	-	B	F.49,L-1
1	mandible section w/p4,m1, m2	Lt.	NB	Trench B,lot #4
1	medial calcaneum fragment	Rt.	NB	Trench C, spoil
1	distal tibia	Rt.	B	83.350 (F.35,L-1)
<u>Bison</u>				
1	glenoid & neck of scapula	Rt.	NB	F.2,L-9
<u>Homo s. sapiens</u>				
1	medial tibia	Lt.	NB	F.11,L-2
<u>Birds</u>				
<u>Anas cf. platyrhynchos</u>	1	carpometacarpus	B	F.2,L-9
<u>Anas carolinensis</u> or <u>discors</u>	1	distal tibiotarsus	NB	F.2,L-8
<u>Mergus merganser</u>	1	humerus	NB	F.2,L-9
<u>Grus canadensis</u>	1	distal carpometacarpus	NB	F.2,L-9
	1	phalanx I of digit II	NB	F.2,L-9

Table 7 (continued): Mammal and Bird Elements at 47LC61

<u>Birds (cont.)</u>	<u>No.</u>	<u>Element</u>	<u>Side</u>	<u>Burned/ Non-burned</u>	<u>Provenience Feature/Level</u>
Large duck/goose sized bird	1	coracoid	Lt.	NB	F.2,L-9
Medium sized duck	1	coracoid	Lt.	NB	F.2,L-6
	1	proximal humerus	Lt.	NB	F.2,L-6
	1	humerus	Lt.	B	F.2,L-8
	1	carpometacarpus	Lt.	B	F.2,L-8
Small sized duck	1	coracoid	Rt.	B	F.2,L-8
	1	radius	Lt.	NB	83.508 (F.2,L-7)
Medium sized bird	1	carpometacarpus	Lt.	NB	F.13,L-1
cf. Passeriformes	1	carpometacarpus	Rt.	NB	F.9,L-1
	1	tibiotarsus	Rt.	NB	83.96
	1	coracoid	Lt.	NB	83.146 (F.13,L-3)



Table 8 : Distribution of Eggshell Fragments in Feature 2  
(47LC61)

<u>Excavation Level</u>	water screen size		
	<u>1/4-inch</u>	<u>1/8-inch</u>	<u>1/16-inch</u>
Level 6	-	3	-
Level 7	-	4	13
Level 8	38	249	168
Level 9	4	115	77
Subtotals	42	371	258

Total number of fragments = 671

### Floral Remains

Floral remains from the Pammel Creek Site were recovered through flotation of matrix samples collected from Feature profiles. Both heavy and light fractions were microscopically sorted at the Mississippi Valley Archaeology Center. Seed and nut specimens with a possibility of being identifiable were sent to Leonard Blake at Washington University (St. Louis). Those specimens not identified by Blake were also examined by Katherine Stevenson (Mississippi Valley Archaeology Center).

Charred floral remains were recovered from virtually all contexts at the site. Table 9 presents the results of Blake's and Stevenson's analyses of these materials. Except for wood charcoal, corn remains (Zea mays) were by far the most common identifiable floral remains recovered. Corn was present in 16 of the 19 features from which identifiable remains were recovered. Blake's analysis of the measurable cob cupules indicated that 8, 10, and 12-rowed varieties were present. He interpreted the 8 and 10-rowed examples as being of the Eastern Eight Row race, with the 12-rowed example possibly representing a survival of an earlier hard flint or popcorn variety, although it may have come from the tip of an Eight Row cob. A fragment of gourd rind (Lagenaria siceraria) was recovered from Feature 4, and a bean (Phaseolus vulgaris) was found in Feature 24.

Species represented by the wild native plant remains would all have been available within the catchment reconstructed in Figure 3. Many of the grass and weedy plants may have been growing at the site during the Oneota occupation. The identified nut-producing trees may also have been present immediately adjacent to the site, but if not, they would have been available from the nearby bluff slopes. The only wild plant represented in the identified remains which could not have been immediately available is wild rice (Zizania aquatica), but this grain may have been growing in the adjacent floodplain of the Mississippi River. Preserved wild rice remains have also been recovered from the Olson and Overhead Oneota sites (K. Stevenson, personal communication).

TABLE 9 : Identified Floral Remains per Provenience at 47Lc61.  
Feature 1

Level 1  
 Corn cupule fragments  
 77 dock (Rumex sp.) seeds  
 1 unidentified seed  
 uncarbonized seeds

Feature 2

Level 2  
 Corn kernel fragment  
 1 dock (Rumex sp.) seed  
 1 unidentified seed  
 5 uncarbonized seeds ?

Level 3  
 1 Corn kernel 8-rowed ear  
 1 corn cupule  
 1 Amaranthus sp.  
 3 unidentified seeds  
 3 unidentifiable seeds  
 1 fungus fragment

Level 4  
 Corn cupule fragments  
 corn cob fragments  
 2 Hawthorne (Crataegus) fragments ?

Level 5  
 Corn kernel fragments  
 1 corn cupule fragment  
 1 unidentifiable fragment

Level 6  
 Corn kernel fragments  
 1 Sumac (Rhus sp.) seed  
 fungus fragment

Level 7  
 Corn kernel fragments  
 2 unidentified seeds  
 1 unidentified fragment

Level 8  
 Corn kernel fragments

Level 9  
 Corn kernel fragments

Level 11  
 2 Unidentifiable fragments  
 2 uncarbonized seeds

Level 12  
 1 Corn kernel fragment  
 1 unidentified seed  
 several unidentifiable fragments

Feature 3

Level 1  
 Corn kernel fragments  
 2 hickory nut (Carya sp.) fragments  
 3 wild rice (Zizania aquatica)  
     grain fragments  
 3-4 unidentified seeds  
 3-4 uncarbonized seeds

TABLE 9 (continued).

Feature 4

Level 1	Corn cob fragments corn kernel fragments uncarbonized seeds
Level 2	1 Corn kernel fragment 1 gourd rind ( <u>Lagenaria siceraria</u> ) fragment
Level 3	1 Corn kernel and 1 fragment 1 corn cupule 3 dock ( <u>Rumex</u> sp.) seeds unidentifiable fragments
General fill	1 Corn kernel and fragments 2 cupules and fragments uncarbonized seeds

Feature 5

Level 1&2	2 Corn cupule fragments 1 corn kernel fragment uncarbonized seeds
Level	1 Corn cob glume fragment uncarbonized seeds
Level 5	Uncarbonized seeds

Feature 7

Level 1	1 Corn cupule 10 rowed ear and fragments corn kernel fragments 1 fungus fragment uncarbonized seeds
Level 2	2 Hickory nut shells ( <u>Carya</u> sp.) fragments 1 black walnut shell ( <u>Juglans nigra</u> ) fragment uncarbonized seeds
Level 3	9 Hickory nut shell ( <u>Carya</u> sp.) fragments
Level 4	1 Corn kernel and fragments 1 corn cupule 1 unidentified seed (large) 1 unidentifiable seed (small)
Level 5	1 Corn kernel
Profile	1 Cupule 8-rowed ear and fragments 3 hickory nut shell ( <u>Carya</u> sp.) fragments 1 fungus 1 unidentified seed ( <u>graminae</u> ?) uncarbonized seeds

Feature 9

Level 1	Corn cob fragments corn kernel fragments 1 unidentified seed 1 unidentifiable seed uncarbonized seeds
---------	---

TABLE 9 (continued)

Feature 9

- |         |   |
|---------|---|
| Level 2 | 1 Corn kernel fragment<br>3 fungus fragments<br>1 unidentifiable seed |
| Level 3 | 2 Unidentifiable fragments  |
| Level 4 | 1 Unidentifiable fragment   |
| Level 5 | 1 Corn kernel<br>1 corn cupule 8-rowed ear                            |
| Level 6 | 2 Unidentified seeds<br>1 uncarbonized seed                           |
| Level 7 | 1 fungus fragment   |

Feature 10

- |         |  |
|---------|--|
| Level 1 | 1 Corn cupule fragment<br>1 wild rice ( <u>Zizania aquatica</u> )<br>grain fragment<br>2 unidentified seeds ( <u>Amaranthus?</u> )<br>uncarbonized seeds |
|---------|--|

Feature 11

- |         |  |
|---------|--|
| Level 1 | 1 Probable wild rice ( <u>Zizania aquatica</u> )<br>grain fragment<br>1 blackberry or raspberry ( <u>Rubus</u> sp.) seed<br>uncarbonized seeds                   |
| Level 2 | 3 Possible wild rice ( <u>Zizania aquatica</u> )<br>grain fragments<br>1 unidentifiable fragment<br>uncarbonized seeds   |
| Level 3 | 1 Probable wild rice ( <u>Zizania aquatica</u> )<br>grain fragment<br>1 possible wild rice ( <u>Zizania aquatica</u> )<br>grain fragment<br>2 uncarbonized seeds |
| Level 4 | 2 Corn kernel fragments<br>uncarbonized seeds  |

Feature 13

- |         |  |
|---------|--|
| Level 1 | 5 Corn kernel fragments<br>3 corn cupule fragments<br>1 wild plum ( <u>Prunus americana</u> ) stone<br>4 hickory nut shell ( <u>Carya</u> sp.) fragments<br>uncarbonized seeds                         |
| Level 2 | Corn kernel fragments<br>corn cob fragments<br>8 hickory nut shell ( <u>Carya</u> sp.) fragments<br>1 sumac ( <u>Rhus</u> sp.) seed<br>3 fungus fragments<br>1 unidentified seed<br>uncarbonized seeds |

TABLE 9 (continued)  
Feature 24

Scrapings		1 Common bean ( <u>Phaseolus vulgaris</u> )
Level 1		3 Corn kernels 1 corn stalk 8-rowed ear 1 corn stalk fragment 1 sumac ( <u>Rhus</u> sp.) seed 1 black walnut shell ( <u>Juglans nigra</u> ) fragment 1 possible wild rice ( <u>Zizania aquatica</u> ) grain fragment 3 unidentified seeds uncarbonized seeds
Level 2		1 Corn cupule 10-rowed ear and fragments corn kernel fragments 4 corn cob fragments hickory nut shell ( <u>Carya</u> sp.) fragments 3 fungus fragments 1 possible wild rice ( <u>Zizania aquatica</u> ) grain fragment 1 unidentified seed unidentifiable fragments
Level 3		1 Corn cupule 8-rowed ear 2 corn kernel fragments corn cob fragments 2 grass ( <u>Graminae</u> sp?) seeds 2 unidentified seeds 1 nut shell (possibly hickory - <u>Carya</u> sp?) fragment
Level 4		3 Hickory nut shell ( <u>Carya</u> sp.) fragments
Profile		1 Corn cupule 1 corn husk fragment 5 hickory nut shell ( <u>Carya</u> sp.) fragments 2 nut meat fragments 4 wild plum ( <u>Prunus</u> sp.) stone fragments
<u>Feature 26</u>		
Level 2		2 Corn cob fragments 1 night shade seed? ( <u>Solanum</u> ) uncarbonized seeds
Level 3		4 Corn kernel fragments 1 corn cupule 1 unidentifiable seed and fragments
Level 4		1 Corn kernel fragment
<u>Feature 35</u>		
Level 1		Corn cupule fragments corn glume fragments
Level 2		Unidentified fragments uncarbonized seeds

TABLE 9 (continued)

Feature 35

Level 3  
 Corn cob fragments  
 3 unidentified seeds  
 unidentified seeds

Feature 37

Level 1  
 Unidentified material  
 uncarbonized seeds

Feature 40

Level 1  
 1 Corn kernel fragment  
 2 corn cupule fragments

Level 2  
 1 Corn cupule probably 8-rowed ear and fragments  
 corn kernel fragments  
 5 unidentified fragments  
 unidentifiable seeds

Level 3  
 2 Corn kernel fragments  
 1 goosefoot (Chenopodium sp.) or  
 pigweed (Amaranthus sp.) seed  
 unidentifiable material

Level 4  
 1 night shade (solanum americanum) seed?

Level 6  
 2 Corn cupule fragments  
 1 corn kernel  
 1 corn cob fragment

Level 7  
 1 Corn cupule 8-rowed ear and 3 fragments  
 1 probable wild rice (Zizania aquatica)  
 grain fragment  
 1 possible wild rice (Zizania aquatica)  
 grain fragment  
 unidentified material

Level 8  
 3 Corn cupule fragments

Feature 41

Level 1  
 1 Probable hickory nut shell (Carya sp.) fragment

Level 2  
 1 Corn cupule fragment  
 1 corn cob fragment  
 5 corn kernel fragments

Feature 42

Level 2  
 4 Corn kernel fragments  
 2 unidentified seeds  
 3 uncarbonized seeds

FEATURE 45

Profile  
 2 Black walnut (Juglans nigra) fragments  
 1 goosefoot (Chenopodium sp.) grain  
 1 corn cob fragment ?  
 1 wild rice (Zizania aquatica) grain ?  
 unidentified material  
 uncarbonized seeds

FEATURE 46

Level 2  
 3 Corn cob fragments  
 uncarbonized seeds

## TABLE 9 (continued)

FEATURE 49

Level 1	1 Corn cupule 10-rowed ear and fragments 2 corn kernels and fragments 5 fungus fragments 2 unidentified material unidentifiable material
Level 2	Corn kernel fragments corn cob fragments 2 goosefoot ( <u>Chenopodium</u> sp.) seeds 1 unidentified seed uncarbonized seeds
Level 3	Corn kernel fragments corn cob fragments 1 bullrush ( <u>Scirpus</u> sp.) 1 unidentified seed uncarbonized seeds

FEATURE 77

Level 2	5 Corn cob or stalk fragments uncarbonized seeds
Level 4	1 Unidentifiable seed uncarbonized seeds
Level 6	Uncarbonized seeds



## SUMMARY

Phase II archaeological investigations at the Pammel Creek Site (47Lc61) recovered a substantial amount of information which documents the significance of the site. Undisturbed midden and refuse pit deposits were uncovered over an area of approximately 5400 m<sup>2</sup>, although the site probably extends or extended to the north, south, and west of the project area.

The vast majority of the diagnostic artifacts recovered during this project are indicative of the late prehistoric Oneota culture. A Durst Stemmed point, the base of a side- or corner-notched point, and a single grit-tempered sherd suggest isolated occurrences of other prehistoric groups at the site. However, the Durst Stemmed point has been reworked into a graver-like tool (possibly by an Oneota occupant), and the grit-tempered sherd does not necessarily imply a "Woodland" component at the site. The only concrete evidence of Non-Oneota cultural activity at the site is historic artifacts representing American settlement since the 1840's. While no undisturbed historic remains were uncovered during the test excavations, a rectangular shape seen in a recent aerial photograph at the north end of the project area may indicate the remains of a historic structure.

The Oneota remains at the site were found to be well preserved and very abundant. In the small area sampled, several deep refuse/storage pits, numerous shallow basins, and both scattered and concentrated midden deposits were identified. The top 25 cm of the site had been disturbed from historic cultivation; however, the natural A Horizon continues for another 25 cm, and contains undisturbed cultural deposits. Feature recognition within this horizon was difficult due to the homogeneous nature of the dark sandy loam in the natural A Horizon and the feature fill. The shape of features was discernable only if they extended beneath the A Horizon into the lighter subsoils. Very probably for the same reasons, no structures were identified.

The lack of intrusive pit features identified at the site suggests that the Oneota occupation was relatively short term. This interpretation is supported by the clustering of four radiocarbon dates from feature contexts, which indicate that the Pammel Creek Site was occupied during the fifteenth century A.D. Two of the dated samples were obtained during this study, and the other two during later excavations by the Mississippi Valley Archaeology Center. This relatively narrow range of dates also corresponds with dates from the Oneota component at the Overhead Site, Midway Village, State Road Coulee, and the Sand Lake Site (Table 10). At this time it appears that the La Crosse terrace was rather intensively occupied by Oneota groups shortly before European contact. A lack of associated fur trade period artifacts at the sites further implies that the Oneota abandoned the area just before contact.

Analysis of the artifactual materials at this site points out the confusing nature of employing Oneota ceramics for refined cultural (phase) affiliations. The ceramic assemblage from Pammel Creek contains stylistic elements which are present on both Blue Earth and Orr Phase vessel types. Therefore, the site cannot be affiliated with either of these phases, but suggests influence from or contact with both.

TABLE 10  
Radiocarbon dates available for La Crosse Area Oneota Sites.

SITE	/	DATE (A.D.)	/	LABORATORY
Pammel Creek (47Lc61)		1430 + 70		Wis 1522
		1440 $\pm$ 70		Wis 1525
		1470 $\pm$ 70		Wis 1523
		1520 $\pm$ 70		Wis 1524
.....				
Late Road Coulee (47Lc176)		1550 $\pm$ 60		Wis 1584
.....				
Sand Lake (47Lc44)		1450 $\pm$ 70		Wis 1479
		1460 $\pm$ 70		Wis 1480
		1480 $\pm$ 90		Wis 1477
		1650 (modern)		Wis 1478
.....				
Midway (47Lc19)		1420 $\pm$ 70		Wis 61
		1630 $\pm$ 60		Wis 79
.....				
Overhead (47Lc20)		1485 $\pm$ 55		Wis 601
		1510 $\pm$ 65		Wis 573
.....				
Valley View (47Lc34)		1020 $\pm$ 40		Beta 1676
		1195 $\pm$ 75		Beta 1677

Non-local connections were also indicated by the analysis of the materials used to manufacture stone tools at the site. While the primary material used at the Pammel Creek site was the poor quality chert available in the local dolomite bedrock formations, non-local materials such as Galena, Burlington, and Moline cherts were also found. These three cherts are available only to the south of La Crosse, and as far away as central Illinois and Iowa along the Mississippi River. Some examples of silicified sandstone were also recovered which could represent northern source areas; however, silicified sandstone deposits are also present locally, and the quantity of this material at the Pammel Creek site is miniscule in comparison to the lithic assemblages from Oneota sites to the north of La Crosse such as Olson, Sand Lake, and Midway Village.

The excavations also produced a number of bison scapula tools, but no other bison elements. This too suggests some interaction with outside areas, or possibly seasonal travel by some members of the group to the Plains. The main subsistence items, however, reflect intensive exploitation of a wide range of local resources. Faunal remains include bear, deer, and elk, but primary emphasis on the Mississippi floodplain is indicated by migratory waterfowl (including egg shell), fish, beaver, muskrat, turtle, and naiad remains. Floodplain resource exploitation is also represented by the recovery of wild rice grains.

The primary identified floral remains; however, were charred fragments of corn. Identified as the Eastern Eight Rowed race, these remains were recovered in nearly all of the features, indicating some emphasis on agricultural practice as well. This agrees with the current models of the Oneota subsistence economy as a mixture of agriculture and wild foods, with heavy emphasis on wetland resources. Other cultigens were only minimally represented in the form of a charred bean, and a gourd rind fragment. Nuts and seeds of native plants could all have been obtained within a short distance of the site.

In summary, the Pammel Creek Site contains a wealth of information for studying the Oneota Culture at La Crosse, Wisconsin. This site is the only one of the three known Oneota sites at the south end of the La Crosse terrace system at which a portion is known to be preserved. The Overhead site is scheduled for intensive development, and the Jim Braun Site was severely disturbed several years ago. Based on the results of this investigation, it is strongly recommended that the Pammel Creek Site be nominated to the National Register of Historic Places. Additional evidence of significance was uncovered during a later excavation at the site, when a human burial was located.

At this time, a portion of the western half of the park is being considered as a park easement by the City of La Crosse, and the St. Paul District Corps of Engineers has redesigned its plans for the sedimentation basin in order to avoid significant areas of the site. A portion of the site, however, may be affected during the City of La Crosse's construction of a sedimentation basin in the eastern half of the park. Because the exact boundary of significant cultural deposits is not yet known, it is recommended that a qualified archaeologist be requested to consult with the City of La Crosse in future planning and implementation of their construction activities. Finally, if

future issues require disturbance of the western portion of the park, it is urged that a feasible mitigation plan be implemented in order to recover at least some of the important information present at the Pammel Creek Site. An example of such a plan is included in Appendix E of this report.

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APPENDIX A  
CULTURAL MATERIALS PER PROVENIENCE



## Cultural materials recovered per provenience from 47Lc61.

SURFACE

## Lithics:

- 3 projectile points (stage 5 bifaces)
- 1 knife (stage 3 biface)
- 3 drill/perforators
- 8 end scrapers
- 3 side scrapers
- 39 retouched flakes
- 1 notched flake
- 7 utilized flakes
- 1 worn flake
- 6 biface tool fragments (stage 6 bifaces)
- 15 cores
- 4 bipolar cores
- 1 stage 1 biface
- 2 stage 2 bifaces
- 1 stage 4 biface
- 12 primary flakes
- 22 secondary flakes
- 113 tertiary flakes
- 213 chips
- 45 shatter
- 1 hammerstone
- 4 abraders
- 410.3 g fire-cracked rock
- 54 miscellaneous rock

## Ceramics (all shell tempered):

- 31 decorated sherds
- 152 undecorated sherds

## Floral and Faunal:

- 64 bone
- 17 charred floral remains (1.9 g)

## Historic (12)

## Other (45)

## Cultural materials (continued)

TEST PIT 1

2 chips  
 8.7 g fire-cracked rock  
 1 undecorated sherd  
 2 historic

TEST PIT 2

2 chips  
 1 shatter

TEST PIT 3

7 chips  
 5 miscellaneous rock  
 5 decorated sherds  
 7 undecorated sherds  
 2 bone  
 1.4 g charred floral

FEATURE 1

1 secondary flake  
 1 tertiary flake  
 1631.3 g. fire-cracked rock  
 9 decorated sherds  
 38 undecorated sherds  
 59 bone and fragments

FEATURE 2

1 projectile point  
 2 biface tool fragments  
 2 end scrapers  
 6 retouched flakes  
 1 core  
 2 bipolar cores  
 2 primary flakes  
 1 secondary flake  
 10 tertiary flakes  
 26 chips  
 4 shatter  
 10 miscellaneous rocks  
 13476.4 g fire-cracked rock  
 32 decorated sherds  
 118 undecorated sherds  
 854 bone and fragments  
 671 bird egg shell fragments  
 7 charred floral remains (23.3 g)  
 1 copper bead

## Cultural materials (continued)

FEATURE 3

- 2 chips
- 4 miscellaneous rocks
- 645.3 g fire-cracked rock
- 2 decorated sherds
- 26 undecorated sherds
- 66 bone and fragments
- charred floral remains (1.9 g)

FEATURE 4

- 1 secondary flake
- 1 tertiary flake
- 7 chips
- 3178.3 g fire-cracked rock
- 5 decorated sherds
- 37 undecorated sherds
- 12 bone
- charred floral remains (1.4 g)
- 1 historic

FEATURE 5

- 1 decorated sherd
- 2 undecorated sherds
- 3 bone
- charred floral remains (.1 g)

FEATURE 7

- 2 retouched flakes
- 1 utilized flake
- 2 bipolar cores
- 1 primary flake
- 21 chips
- 3 miscellaneous rocks
- 856.7 g. fire-cracked rock
- 6 decorated sherds
- 57 undecorated sherds
- 318 bone
- charred floral remains (6.38 g)

FEATURE 8

- 526.4 g fire-cracked rock

## Cultural materials (continued)

FEATURE 9

- 1 end scraper
- 2 retouched flakes
- 1 core
- 1 bipolar core
- 1 biface tool fragment
- 9 tertiary flakes
- 71 chips
- 4 shatter
- 58 miscellaneous rocks
- 11555.6 g fire-cracked rock
- 12 decorated sherds
- 222 undecorated sherds
- 1185 bone and fragments
- charred floral remains (8.3 g)

FEATURE 10

- 1 knife
- 1 biface tool fragment
- 1 retouched flake
- 1 secondary flake
- 1 shatter
- 3 miscellaneous rocks
- 83.3 g fire-cracked rock
- 5 decorated sherds
- 20 undecorated sherds
- 56 bone
- 1 charred floral

FEATURE 11

- 2 end scrapers
- 1 retouched flake
- 3 tertiary flakes
- 18 chips
- 2 shatter
- 1273 g fire-cracked rock
- 15 decorated sherds
- 98 undecorated sherds
- 201 bone
- charred floral remains (2.7 g)
- 1 historic

FEATURE 12

- 4 miscellaneous rocks
- 7 undecorated sherds
- 6 bone

## Cultural materials (continued)

FEATURE 13

- 1 knife
- 4 retouched flakes
- 4 tertiary flakes
- 17 chips
- 1 shatter
- 15 miscellaneous rocks
- 129.7 g fire-cracked rock
- 13 decorated sherds
- 117 undecorated sherds
- 249 bone
- charred floral remains (2.2 g)

FEATURE 14

- 1 tertiary flake
- 1 chip
- 2 undecorated sherds

FEATURE 15

- 2 tertiary flakes
- 1 undecorated sherd

FEATURE 16

- 1 drill/perforator
- 1 biface tool fragment
- 6 chips
- 3 miscellaneous rocks
- 106 g fire-cracked rock
- 1 decorated sherd
- 7 undecorated sherds
- bone fragments

FEATURE 17

- 1 chip
- 1405.3 g fire-cracked rock
- 1 decorated sherd
- 14 undecorated sherds
- 36 bone

FEATURE 18

- 1 end scraper
- 1 retouched flake
- 1 utilized flake
- 1 secondary flake
- 3 tertiary flakes
- 36 chips
- 5 miscellaneous rocks
- 466.5 g fire-cracked rock
- 2 decorated sherds
- 58 undecorated sherds
- 48 bone
- charred floral remains (14.1 g)

## Cultural materials (continued)

FEATURE 19

- 1 secondary flake
- 3.4 g fire-cracked rock
- 1 decorated sherd
- 1 undecorated sherd
- charred floral remains

FEATURE 20

- 1 miscellaneous rock
- 1 decorated sherd
- 2 undecorated sherds
- 9 bone
- charred floral remains (.1 g)

FEATURE 21

- 1 notched flake
- 1 chip
- 23 g fire-cracked rock
- charred floral remains (6.9 g)

FEATURE 22

- 1 biface tool fragment
- 2 tertiary flakes
- 16 chips
- 4 miscellaneous rock
- 12.2 g fire-cracked rock
- 2 decorated sherds
- 5 undecorated sherds
- charred floral remains (99.5 g)

FEATURE 24

- 1 end scraper
- 1 worn flake
- 7 tertiary flakes
- 42 chips
- 11 miscellaneous rocks
- 881.7 g fire-cracked rock
- 15 decorated sherds
- 114 undecorated sherds
- 36 bone
- charred floral remains (15.8 g)

## Cultural materials (continued)

FEATURE 26

- 1 projectile point
- 1 end scraper
- 4 retouched flakes
- 1 biface tool fragment
- 1 primary flake
- 3 secondary flakes
- 8 tertiary flakes
- 87 chips
- 2 shatter
- 1 hammerstone
- 25 miscellaneous rocks
- 46.9 g fire-cracked rock
- 8 decorated sherds
- 88 undecorated sherds
- 220 bone
- charred floral remains (7.1 g)

FEATURE 28

- 1 side scraper
- 1 retouched flake
- 31 chips
- 2 miscellaneous rocks
- 2.6 g fire-cracked rocks
- 7 decorated sherds
- 34 undecorated sherds
- 16 bone
- charred floral remains (1.34 g)

FEATURE 29

- 1 utilized flake
- 5 chips
- 193.5 g fire-cracked rock
- 2 decorated sherds
- 17 undecorated sherds
- charred floral remains (.5 g)

FEATURE 30

- 1 utilized flake
- 2 chips
- 1 miscellaneous rock
- 6 undecorated sherds

FEATURE 31

- 1 secondary flake
- 3 tertiary flakes
- 5 chips
- 1 miscellaneous rock
- 443.1 g fire-cracked rock
- 11 undecorated sherd
- 71 bone
- charred floral remains (.1 g)

## Cultural materials (continued)

FEATURE 32

- 1 stage 4 biface
- 1 chip
- 40.7 g fire-cracked rock
- 3 undecorated sherds
- charred floral remains (.1 g)

FEATURE 33

- 8 chips
- 4 miscellaneous rocks
- 7 undecorated sherds
- 16 bone
- 1 historic

FEATURE 34

- 3 chips
- 0.6 g fire-cracked rock
- 2 undecorated sherds

FEATURE 35

- 1 retouched flake
- 2 tertiary flakes
- 18 chips
- 1 shatter
- 1 abrader
- 3 miscellaneous rocks
- 912.4 g fire-cracked rock
- 7 decorated sherds
- 134 undecorated sherds
- 152 bone and fragments
- charred floral remains (1.7 g)

FEATURE 37

- 1 core
- 1 secondary flake
- 2 tertiary flakes
- 2 chips
- 1 miscellaneous rock
- 15.8 g fire-cracked rock
- 3 decorated sherds
- 3 undecorated sherds

FEATURE 38

- 1 hammerstone
- 1 miscellaneous rock
- 3 undecorated sherds



## Cultural materials (continued)

FEATURE 39

- 1 biface tool fragment
- 1 utilized flake
- 3 tertiary flakes
- 34 chips
- 1 shatter
- 1 hammerstone
- 1 abrader
- 11 miscellaneous rock
- 1654.3 g fire-cracked rock
- 15 decorated sherds
- 75 undecorated sherds
- 146 bone
  - charred floral remains (2.1 g)
- 2 historic

FEATURE 40

- 1 knife
- 1 drill/perforator
- 1 retouched flake
- 1 core
- 1 stage 2 biface
- 1 primary flake
- 2 tertiary flakes
- 31 chips
- 18 miscellaneous rocks
- 2671.9 g fire-cracked rock
- 10 decorated sherds
- 89 undecorated sherds
- 133 bone and fragments
  - charred floral remains (45.26 g)

FEATURE 41

- 7 tertiary flakes
- 23 chips
- 1 shatter
- 19 miscellaneous rocks
- 1570.4 g fire-cracked rock
- 12 decorated sherds
- 61 undecorated sherds
- 11 bone and fragments
  - charred floral remains (.75 g)

FEATURE 42

- 3 secondary flakes
- 2 tertiary flakes
- 17 chips
- 4 miscellaneous rocks
- 5 decorated sherds
- 29 undecorated sherds
- 144 bone
  - charred floral remains (13.6 g)

## Cultural materials (continued)

FEATURE 43

3 tertiary flakes  
 2 chips  
 0.9 g fire-cracked rock  
 3 undecorated sherds  
 charred floral remains (2.4 g)

FEATURE 44

2 retouched flakes  
 1 biface tool fragment  
 18 chips  
 1 shatter  
 119.1 g fire-cracked rock  
 2 decorated sherds  
 93 undecorated sherds  
 102 bone  
 charred floral remains (6.5 g)

FEATURE 45

1 chip  
 1 undecorated sherd  
 bone fragments  
 charred floral remains (.2 g)

FEATURE 46

5 chips  
 1 hammerstone  
 27 miscellaneous rocks  
 4994.6 g fire-cracked rock  
 6 decorated sherds  
 27 undecorated sherds  
 15 bone and fragments

FEATURE 47

5 chips  
 2 miscellaneous rocks  
 72.4 g fire-cracked rock  
 22 undecorated sherds  
 3 bone  
 charred floral remains (.1 g)

FEATURE 48

1 secondary flake  
 2 chips  
 0.7 g fire-cracked rock  
 2 undecorated sherds  
 charred floral remains (.1 g)

## Cultural materials (continued)

FEATURE 49

- 1 stage 4 biface
- 1 primary flake
- 1 secondary flake
- 3 tertiary flakes
- 20 chips
- 9 miscellaneous rocks
- 365.6 g fire-cracked rock
- 4 decorated sherds
- 53 undecorated sherds
- 125 bone and fragments
- charred floral remains (17.2 g)

FEATURE 52

- 1 secondary flake
- 2 chips
- 2 miscellaneous rocks
- 1 decorated sherd
- 4 undecorated sherds
- 3 bone
- charred floral remains (.5 g)

FEATURE 77

- 1 tertiary flake
- 48 g fire-cracked rock
- 1 undecorated sherd
- 324 bone (shell)
- charred floral remains (1.7 g)

Table 1: Lithic materials recovered from 47Lc61.

Lithic Tools

8 projectile points  
 4 knives  
 5 drill/perforators  
 17 end scrapers  
 4 side scrapers  
 75 retouched flakes  
 2 notched flakes  
 12 utilized flakes  
 2 worn flakes  
 27 biface tool fragments  
 5 hammerstones  
 7 abraders  
 1 groundstone

Lithic Reduction Categories

20 cores  
 9 bipolar cores  
 1 stage 1 biface  
 3 stage 2 bifaces  
 stage 3 bifaces (see knives)  
 3 stage 4 bifaces  
 stage 5 bifaces (see projectile points)  
 stage 6 bifaces (see biface tool fragments)  
 17 primary flakes  
 28 secondary flakes  
 317 tertiary flakes  
 786 chips  
 60 shatter

Miscellaneous

511.6 kg. fire-cracked rock  
 379 miscellaneous rock

APPENDIX B  
SCOPE OF WORK

SCOPE OF WORK  
CULTURAL RESOURCES INVESTIGATION  
OF SITE 47LC61 AND SURVEY OF PORTIONS OF THE  
STATE ROAD AND EBNER COULEE PROJECT,  
LA CROSSE, WISCONSIN

1.00 INTRODUCTION

1.01 The Contractor will undertake a cultural resources investigation of Site 47LC61 and survey of portions of the State Road and Ebner Coulee flood control project, La Crosse, Wisconsin.

1.02 This cultural resources inventory partially fulfills the obligations of the Corps of Engineers (Corps) regarding cultural resources, as set forth in the National Historic Preservation Act of 1966 (Public Law (P.L.) 89-665), as amended; the National Environmental Policy Act of 1969 (P.L. 91-190); Executive Order (E.O.) 11593 for the "Protection and Enhancement of the Cultural Environment" (Federal Register, 13 May 1971); the Archaeological and Historical Preservation Act of 1974 (P.L. 93-291); the Advisory Council on Historic Preservation "Regulations for the Protection of Historic and Cultural Properties (36 CFR Part 800); the Department of the Interior guidelines concerning cultural resources (36 CFR Part 60); and the applicable Corps regulations (ER 1105-2-50).

1.03 The laws listed above establish the importance of Federal leadership, through the various responsible agencies, in locating and preserving cultural resources within project areas. Specific steps to comply with these laws, particularly as directed in P.L. 93-291 and E.O. 11593, are being taken by the Corps " . . . to assure that Federal plans and programs contribute to the preservation and enhancement of non-federally owned sites, structures, and objects of historical, architectural, or archaeological significance." A part of that responsibility is to locate, inventory, and nominate to the Secretary of the Interior all such sites in the project area that appear to qualify for listing on the National Register of Historic Places.

1.04 Executive Order 11593 and the 1980 amendments to the National Historic Preservation Act further direct Federal agencies " . . . to assure that any federally owned property that might qualify for nomination is not inadvertently transferred, sold, demolished or substantially altered." In addition, the Corps is directed to administer its policies, plans, and programs so that federally and non-federally owned sites, structures, and objects of historical, architectural, or archaeological significance are preserved and maintained for the inspiration and benefit of the people.

1.05 This cultural resources investigation will serve several functions. The report will be a planning tool to aid the Corps in meeting its obligations to preserve and protect our cultural heritage. It will be a comprehensive, scholarly document that not only fulfills federally mandated legal requirements but also serves as a scientific reference for future professional

studies. It will identify sites that may require additional investigations and that may have potential for public-use development. Thus, the report must be analytical in nature, not just descriptive.

## 2.00 PROJECT DESCRIPTION

2.01 The State Road and Ebner Coulee flood control project is located in La Crosse County in west-central Wisconsin on the east side of the city of La Crosse. The plan of improvement for local protection consists of channel deepening and enlarging downstream from Hagen Bridge to the mouth and includes 12,300 feet of concrete-lined rectangular and trapezoidal channel, 700 feet of riprap channel, two overflow spillways, a drop structure, a stilling basin, three new street bridges, and a new railroad bridge. The upper 5,400 feet of rectangular channel is designed for standard project flood (SPF) protection and the remaining 7,600 feet of channel is designed for 100-year protection.

2.02 Site 47LC61 was discovered during a field investigation conducted by the Center for Research Archaeology, La Crosse, Wisconsin, in October 1980. This site is located in the NW 1/4, NW 1/4, SW 1/4, Sec. 22 T15N R7W. The cultural material recovered from this site includes both lithic and ceramic artifacts. The majority of the ceramic material is undecorated, shell-tempered ware. The few sherds which are decorated have been identified as Allamakee Trilled Ware which is characteristic of the Orr Phase of the Oneota culture (ca. A.D. 1400). No diagnostic lithic material was recovered from this site. A southern unit of this site contained a diversified faunal assemblage consisting of various species of mammals and reptiles and some freshwater mussels. The site boundaries encompass only about 50 square meters. However, other localities may have been missed because of the 15-meter testing interval that was used.

2.03 Although the areas to be impacted by this proposed flood control project were previously surveyed for cultural resources, project modifications have resulted in some changes to the proposed areas of impact. One of these areas is located between Pammel Creek and Pammel Creek Road and is bounded by 96th Avenue and Drive-In Road. This area has not been previously surveyed.

## 3.00 DEFINITIONS

3.01 For the purpose of this study, the cultural resources investigation will involve Phase II testing. A literature and records search and review and a Phase I survey will not be conducted at this time.

3.02 "Cultural resources" are defined to include any building, site, district, structure, object, data, or other material relating to the history, architecture, archaeology, or culture of an area.

3.03 "Phase I cultural resources survey" is defined as an intensive, on-the-ground survey and testing of an area sufficient to determine the number and extent of the resources present and their relationship to project features. A Phase I cultural resources survey will result in data adequate to assess the

general nature of the sites present; a recommendation for additional testing of those resources which, in the professional opinion of the Contractor, may provide important cultural and scientific information; and detailed time and cost estimates for Phase II testing.

3.04 "Phase II testing" is defined as the intensive testing of those sites that may provide important cultural and scientific information. Phase II testing will result in data adequate to determine the eligibility of the resources for inclusion on the National Register of Historic Places, a plan for the satisfactory mitigation of eligible sites that will be directly or indirectly impacted, and detailed time and cost estimates for mitigation.

#### 4.00 SURVEY AND TESTING SPECIFICATIONS

4.01 Phase II testing will be conducted at Site 47LC61 as shown on Map A (inclosed).

4.02 A Phase I cultural resources survey will be conducted in the area bounded by Pammel Creek and Pammel Creek Road and 96th Avenue and Drive-In Road as shown on Map B (inclosed).

#### 5.00 PERFORMANCE SPECIFICATIONS

5.01 The Contractor will use a systematic, interdisciplinary approach in conducting the study. The Contractor will provide specialized knowledge and skills during the course of the study to include expertise in archaeology and in other social and natural sciences as required.

5.02 The extent and character of the work to be conducted by the Contractor will be subject to the general supervision, direction, control, review, and approval of the Contracting Officer.

5.03 Techniques and methodologies that the Contractor uses during the investigation shall be representative of the current state of knowledge for their respective disciplines.

5.04 The Contractor must keep standard records that shall include, but not be limited to, field notebooks, site survey forms, field maps, and photographs.

5.05 The recommended professional treatment of recovered materials is curation and storage of the artifacts at an institution that can properly insure their preservation and that will make them available for research and public view. If such materials are not in Federal ownership, the consent of the owner must be obtained, in accordance with applicable law, concerning the disposition of the materials after completion of the report. The Contractor will be responsible for making curatorial arrangements for any collections that are obtained. Such arrangements must be coordinated with the appropriate officials of Wisconsin and approved by the Contracting Officer.



5.06 When sites are not wholly contained within the project limits, the Contractor shall survey an area outside the project limits large enough to include the entire site within the survey area. This procedure shall be done in an effort to delineate site boundaries and to determine the degree to which the site will be impacted.

5.07 The Contractor shall provide all materials and equipment as may be necessary to expeditiously perform those services required of the study.

5.08 Should it become necessary in the performance of the work and services, the Contractor shall, at no cost to the Government, secure the rights of ingress and egress on properties not owned or controlled by the Government. The Contractor shall secure the consent of the owner, his representative, or agent, in writing prior to effecting entry on such property. If requested, a letter of introduction, signed by the District Engineer, can be provided to explain the project purposes and request the cooperation of landowners. When a landowner denies permission for survey, the Contractor shall immediately notify the Contracting Officer and shall describe the extent of the property to be excluded from the survey.

5.09 The Contractor will test the site areas sufficiently to determine the existence of cultural materials and/or features, their condition (in situ or disturbed), the horizontal and vertical distribution of the remains, and, if possible, the cultural affiliation of the site(s).

5.10 Recommendations on the significance of the site(s) according to the National Register of Historic Places criteria will be included in the Contractor's report. These recommendations will include a detailed justification for the significance or non-significance of the site(s), including what research questions the site(s) can answer.

5.11 The on-the-ground examination will involve an intensive survey and shovel testing of the area to determine the number and extent of cultural resources present. This includes standing structures as well as historical and prehistorical archaeological sites.

5.12 The Contractor's survey will include surface inspection in areas where surface visibility permits adequate recovery of cultural materials and subsurface testing in all areas where surface visibility is limited or obscured. Subsurface investigation will include shovel testing, coring, soil borings, cut bank profiling or some other appropriate testing method. If field methods vary from those required, they must be described and justified in the report.

5.13 The required survey grid or transect interval is 15 meters (50 feet) and testing interval is 15 meters (50 feet). However, this interval may vary depending upon field or site density/size conditions. If the recommended interval is not used, written justification should be presented in the technical report for selection of an alternate interval. All subsurface tests will be screened through 1/4-inch mesh hardware cloth and will be recorded on

appropriate testing forms. All subsurface testing forms will be included in the appendix to the Contractor's report. The Contractor will also indicate the locations of all subsurface tests on USGS and/or project maps and key these with the testing forms in the appendix.

5.14 The Contractor will recommend appropriate mitigative measures, including time and cost estimates, where warranted.

5.15 All testing will employ standard archaeological techniques, including formal test pits. All material will be screened through 1/4-inch mesh screen.

5.16 The tested areas will be returned as closely as practical to pre-survey conditions by the Contractor.

#### 6.00 GENERAL REPORT REQUIREMENTS

6.01 The Contractor will submit the following types of reports, which are described in this section and in section 9.00: field report, field notes, draft contract report, final contract report, and a completed National Register form(s), if appropriate.

6.02 The Contractor's technical report will include, but will not be limited to, the following sections, as appropriate to the study.

a. Title Page: The title page will provide the following information: the type of investigation undertaken; the cultural resources that were assessed (archaeological, historical, and architectural); the project name and location (county and State); the date of the report; the Contractor's name; the contract number; the name of the author(s) and/or Principal Investigator; the signature of the Principal Investigator; and the agency for which the report is being prepared.

b. Management Summary: This section will include a concise summary of the study, which will contain all essential data for using the document in the Corps of Engineers management of the project. This information will minimally include: why the work and budget, summary of the study (field work; lab analysis), study limitations, study results, significance, recommendations, and the repository of all pertinent records and artifacts.

c. Table of Contents

d. List of Figures

e. List of Plates

f. Introduction: This section will identify the sponsor (Corps of Engineers) and the sponsor's reason for the study; an overview of the testing and survey project, with the site(s) located on USGS quad maps. This section will also provide an overview of the cultural resource study to be undertaken; define the location and boundaries of the study areas (with regional and area-specific maps); define the study area within its cultural, regional, and environmental context; reference the scope of work; identify the institute

that did the work, the number of people involved in the study, and the number of person-days/hours spent on the study; identify the dates when the various types of work were completed; identify the repository of records and artifacts; and provide a brief overview or outline of how the study report will proceed and an overview of the major goals that the study/study report will accomplish.

g. Previous Archaeological and Historical Studies: This section will provide a brief summary and evaluation of previous archaeological and historical studies of the study area including the researchers, date, extent, adequacy of the past work, study results, and cultural/behavioral inferences derived from the research.

h. Environmental Background: This section will include a brief description of the study area environment, including the following categories: geology, vegetation, fauna, climate, topography, physiography, and soils, with reference to prehistoric, historic, ethnographic, and contemporary periods. Any information available on the relationship of the environmental setting to the area's prehistory and history will also be included. This section will be of a length commensurate with other report sections.

i. Theoretical and Methodological Overview: This section will include a description or statement of the goals of the Corps of Engineers and the study researcher, the theoretical and methodological orientation of the study, and the research strategies that were applied in achieving the stated goals.

j. Field Methods: This section will describe the specific archaeological activities undertaken to achieve the stated theoretical and methodological goals. The section will include all field methods, techniques, strategies, and rationale or justification for specific methods or decisions. The description of the field methods will minimally include: a description of field conditions, topographic/physiographic features, vegetation conditions, soil types, stratigraphy, testing results with all appropriate testing forms to be included as an appendix, and the rationale for eliminating uninvestigated areas. Testing methods will include descriptions of test units (size, intervals, stratigraphy, depth) and the rationale behind their placement.

k. Laboratory Methods: This section should explain in detail the laboratory methods employed and the rationale behind the method selected. This section should also contain references to accession numbers used for all collections, photographs and field notes obtained during the study, and the location where they are permanently housed.

l. Analysis: This section will describe and provide the rationale for the specific analytic methods and techniques used, and describe and discuss the qualitative and quantitative manipulation of the data. Limitations or problems with the analysis based on the data collection results will also be discussed. This section will also contain references to accession numbers used for all collections, photographs, and field notes obtained during the study, and the location where they are permanently housed.

m. Investigation Results: This section will describe all the archaeological resources encountered during the study, and other data pertinent to a complete understanding of the resources within the study area. This section will include enough empirical data that the study results can be independently assessed. The description of the data will minimally include: a description of the site; amounts and type of material remains recovered; relation of the site or sites to physiographic features, vegetation and soil types; direct and indirect impacts to the site(s); analysis of the site and data (e.g., site type, cultural historical components and information, cultural/behavioral inferences or patterns); site condition; and location and size information (elevation, complete quad map source, legal description, address if appropriate, and site size, density, depth, and extent).

n. Evaluation and Conclusions: This section will evaluate and formulate conclusions concerning location of the site(s); size, condition, distribution, and density in relation to other sites in the area; and significance in relation to the local and regional prehistory, protohistory, and history. This section will also discuss the potential and goals for future research; the reliability of the analysis; relate results of the study and analysis to the stated study goals; identify changes, if any, in the research goals; synthesize and compare the results of the analysis and study; integrate ancillary data; and identify and discuss cultural/behavioral patterns and processes that are inferred from the study and analysis results.

o. Recommendations: This section will discuss the significance of the site(s) in relation to the research goals of the study and the National Register of Historic Places criteria; make recommendations as to the eligibility or potential eligibility of the site(s) to the National Register; recommend future mitigative or Phase II testing priorities and needs, as appropriate; and make suggestions with regard to the Corps of Engineers planning goals. These recommendations will include a time and cost estimate for mitigation or Phase II testing, if necessary. If it is the Contractor's assessment that the site(s) is (are) or is not significant, the methods of investigation and reasoning which support that conclusion will be presented. Any evidence of cultural resources or materials which have been previously disturbed or destroyed will be presented and explained. If certain areas are not accessible, recommendations will be made for future consideration.

p. References: This section will provide standard bibliographic references (American Antiquity format) for every publication cited in the report. References not cited in the report will be listed in a separate "Additional References" section.

q. Appendix: This section will include the Scope of Work, resumes of all personnel involved, all correspondence derived from the study, all State site forms, and all testing and any other pertinent report information referenced in the text as being included in the appendix.

6.03 The location of all sites and other features discussed in the text will be shown on a legibly photocopied USGS map and will be bound into the report. All maps will be labeled with a caption/description, a north arrow, a scale bar, township, range, map size, and dates, and the map source (e.g., the USGS quad name or published source) and will have proper margins.

6.04 All sites identified in the course of the study, including find spots and known sites, will be presented on State site forms as an appendix to the report. Data should also be provided about the present condition of the sites (disturbance by natural or manmade processes) and content of any collections from the sites. Known sites all have their State site forms updated as necessary. All State site forms will be submitted to the State Archaeologist.

6.05 Failure to fulfill these report requirements will result in the rejection of the Contractor's report by the Contracting Officer.

#### 7.00 FORMAT SPECIFICATIONS

7.01 The Contractor shall submit to the Contracting Officer the photographic negatives for all black and white photographs that appear in the final report.

7.02 All text materials will be typed, single-spaced (the draft reports should be space-and-one-half or double-spaced), on good quality bond paper, 8.5 inches by 11.0 inches with 1.5-inch binding and bottom margins and 1-inch margins on the top and other margin, and will be printed on both sides of the paper.

7.03 Information will be presented in textual, tabular, and graphic forms, whichever are most appropriate, effective, or advantageous to communicate the necessary information.

7.04 All figures and maps must be clear, legible, self-explanatory, and of sufficiently high quality to be readily reproducible by standard xerographic equipment, and will have margins as defined above.

7.05 The final report cover letter shall include a budget of the project.

7.06 The draft and final reports will be divided into easily discernible chapters, with appropriate page separation and heading.

#### 8.00 MATERIALS PROVIDED

8.01 The Contracting Officer will furnish the Contractor with the following materials: access to any publications, records, maps, or photographs that are on file at the district headquarters.

#### 9.00 SUBMITTALS

9.01 The Contractor will submit reports according to the following schedules:

a. Field Report: The original and one copy of a field report will be submitted after completion of the field work. The field report will summarize the work, project/field limitations, methodology used, time used, and survey results.

b. Project Field Notes: One legible copy of all the project field notes will be submitted with the draft contract report.

c. Draft Contract Report: Seven (7) copies of the draft contract report will be submitted on or before \_\_\_\_\_ days after contract award but no later than June 1983. The draft contract report will be reviewed by the Corps of Engineers, the State Historic Preservation Officer, the State Archaeologist, and the National Park Service. The draft contract report will be submitted according to the report and contract specifications outlined in this Scope of Work.

d. Final Contract Report: The original and 15 copies of the final contract report will be submitted 60 days after the Corps of Engineers comments on the draft contract report are received by the Contractor. The final contract report will incorporate all the comments made on the draft contract report.

e. National Register Forms: An original and one copy of a completed National Register Nomination Form(s) will be submitted with the final contract report.

9.02 Neither the Contractor nor his representative shall release any sketch, photograph, report, or other material of any nature obtained or prepared under the contract without specific written approval of the Contracting Officer prior to the acceptance of the final report by the Government. After the Contracting Officer has accepted the final report, distribution will not be restricted by either party except that data relating to the specific location of extant sites will be deleted in distribution to the public.

9.03 All materials, documents, collections, notes, forms, maps, etc., which have been produced, gathered, or acquired in any manner for use in the completion of this contract shall be made available to the Contracting Officer upon request.

#### 10.00 METHOD OF PAYMENT

10.01 Requests for partial payment under this fixed price contract shall be made monthly on ENG Form 93. A 10-percent retained percentage will be withheld from each partial payment. Upon approval of the final reports by the Contracting Officer, final payment, including previously retained percentage, shall be made.

# 11.00 Addendum to Scope of Work

11.01 The following paragraphs amend the scope of work for "Cultural Resources Investigation of Site 47LC61 and Survey of Portions of the State Road and Ebner Coulee Project, La Crosse, Wisconsin."

11.02 The intent of the testing portion of the original contract was to gather sufficient data to determine the eligibility of site 47LC61 to the National Register of Historic Places. An advanced construction schedule for a portion of this project now makes a separate testing-mitigation approach infeasible. Through coordination with the State Historic Preservation Office (SHPO), it is now intended that the testing-mitigation phases be combined so that data recovery is completed with no further work required at this site prior to construction. For the purposes of this project, the Corps and the SHPO have agreed that the site would likely be eligible to the National Register and that data recovery is warranted and is the most expedient approach to handling this mitigation within the project's time constraints.

11.03 The required reports, as referenced in section 6 above, should be altered so that recommendations for future research goals, designs, etc., are carried out as a part of the present study. Thus the report will become a mitigation document which presents a detailed analysis of site 47LC61.

11.04 The site boundaries listed in section 2.02 of this scope of work are incorrect. These boundaries describe feature 1 of site 47LC61, in which a dense artifact concentration was located. Although not listed in the 1980 report, the following shovel tests in the present study area contained a light scatter of artifacts:

II - 6,7,10,11, & 12

III - 3,5, & 7

IV - 1,2,4,6, & 8-12

V - 1-5, 6-10, & 12

VI - 1-9, & 11-12

VII - 1-4, 6-8, & 10-12

Of this material, that in the eastern half (rows I-IV) appeared to be extensively disturbed (1980 report, p. 22). Thus, site testing should focus on the western half of the park area as described in the 1980 report.

11.05 The St. Paul District may find it necessary to exercise an option to modify the present scope of work to include additional survey work in upland fill areas which have not yet been identified. Costs for any additional survey work will be negotiated at a later time and therefore should not be entered into the present survey and testing as contingency costs. The St. Paul District makes no guarantee that any additional work will be undertaken.

APPENDIX C  
PERSONNEL RESUMES



GENERAL INFORMATION:

Name: James Patrick Gallagher

PII Redacted

Present Position and Academic Rank: Associate Professor, University of Wisconsin-La Crosse; Executive Director, Mississippi Valley Archaeology Center at the University of Wisconsin-La Crosse.

EDUCATION:

B.S. Anthropology, Saint Louis University, 1964

M.A. Anthropology, Southern Methodist University, 1969

Ph.D. Southern Methodist University, 1977

Dissertation Title: Ethnoarchaeological and Prehistoric Investigations in the Ethiopian Central Rift Valley.

PROFESSIONAL EXPERIENCE: TEACHING

University of Oklahoma, teaching assistant, 1966-67

Trinidad Jr. College, Trinidad, Colorado, director of archaeology field school, 1968

Southern Methodist University, teaching assistant, 1969

Southern Methodist University, Instructor, University College, 1970, 1972

El Centro College, Dallas, Texas, Instructor, 1972-1977

University of Wisconsin-La Crosse, 1977 - Present

RESEARCH

Archaeologist, Illinois State Museum (J. Caldwell), summer 1963

Archaeologist, Wisconsin State Museum excavations at Aztalan (J. Freeman), summer 1964

Research Assistant, University of Oklahoma Spiro Mound Project (J. Brown), 1964-66

Archaeologist, University of Oklahoma (R. Bell), summer 1965

Ethnographer, one semester ethnographic project in Kiowa Apache material culture (A. Ricciardelli) 1964, University of Oklahoma

Archaeologist, excavations at Roc de Combe, France (F. Bordes) 1966

Research Assistant, Southern Methodist University Nubian Prehistoric Project (J. Shiner), 1967-68

Field Director, archaeology field school, Trinidad Jr. College, Trinidad, Colorado, 1968

Archaeologist, excavations at Pech de l'Aze, France (F. Bordes), 1969

Archaeologist, excavations at Ksar A'Quil, Lebanon (J. Tixier), 1969

Field Director, Southern Methodist University Ethiopian Prehistoric Expedition (F. Wendorf), 1971-72

Principal Investigator, Ethiopian Ethnoarchaeology Project, 1971-72

Field Director, Egyptian Predynastic Project (F. Hassan), 1978

Principal Investigator, archaeological excavations at the Valley View Site, 1978, 1979

Principal Investigator, La Crosse Area Archaeological Survey I, 1979

Principal Investigator, Overhead Site excavation, 1980

Principal Investigator, La Crosse Area Archaeological Survey II, 1980 & 1981

Principal Investigator, Quail Cave excavation, 1981

Principal Investigator, Sand Lake Coulee Project, 1982

Principal Investigator, La Crosse Area Archaeological Survey III, 1982

Principal Investigator, excavations at the Dahl Site, 1982

#### CULTURAL RESOURCE MANAGEMENT PROJECTS

1977

Archaeological survey of the proposed Chippewa River Crossing, Buffalo Co., Wis., Dairyland Power Cooperative, La Crosse.

Archaeological survey of the Holmen Industrial Park. Village of Holmen, Wis.

1978

Archaeological survey of the Alma-Tremval and Alma-Crystal Powerline transmission route (81 miles). Dairyland Power.

Archaeological survey of sewer and water pipe line routes in Medary Township. City of La Crosse.

Archaeological survey of by-pass route in the City of La Crosse. City of La Crosse.

Timber Coulee Creek Survey, Vernon County. Wisconsin Department of Natural Resources.

Archaeological Survey of Lake Marinuka, Galesville, WI. Lake Marinuka Protection and Rehabilitation District.

An archaeological inspection of the Pigeon Creek Bridge area, Trempealeau Co. Westbrook Associates.

1979

Archaeological survey of transmission line routes and substation location in Vernon County. Dairyland Power.

An archaeological inspection of a proposed waste water treatment facility near Dorchester, Clark County, Wis. ETC Engineering Inc.

An archaeological survey of Copeland Park. City of La Crosse.

An archaeological inspection of the Gillett St. viaduct and approaches. City of La Crosse.

An archaeological inspection of a proposed powerline route near Mauston, Juneau Co. Dairyland Power.

An archaeological inspection of a waste water treatment site at Alma, Buffalo Co. ETC Engineering.

An archaeological survey at Brice Prairie, La Crosse Co. Dairyland Power.

An archaeological inspection at Coon Valley, Vernon County. ETC Engineering.

An archaeological survey of Pine Creek, Trempealeau Co. Westbrook Associates.

An archaeological inspection of a bridge crossing site on the Little Baraboo River, Sauk Co. Westbrook Associates.

An archaeological survey of a portion of the Little Grant River, Grant Co. Wisconsin Department of Natural Resources.

An archaeological survey in St. Croix County. Dairyland Power.

An archaeological survey of the proposed right-of-way for County Highway A in Monroe Co. Donahue and Associates.

An archaeological survey of a sewage disposal site at Stoddard, Vernon Co. ETC Engineering.

1980

Thunderbird Hills Archaeological survey, La Crosse, WI. Neitzel Engineering Co.

An archaeological survey of the Washco Substation, Washington County, Wis. Dairyland Power Cooperative.

An archaeological survey of the Comfort Substation in Northern Wisconsin. Dairyland Power Cooperative.

An archaeological survey of the proposed County Highway B project, La Crosse County.

An archaeological survey of the proposed Genoa, Wisconsin-Lansing, Iowa transmission route. Dairyland Power Cooperative.

An archaeological inspection of the Fairchild Site. Dairyland Power Cooperative.

The Potosi substation and transmission route. Dairyland Power.

An archaeological survey of the Pammel Creek area. La Crosse, Wi. U.S. Corps of Engineers.

Phase II excavations at Pammel Creek. U.S. Corps of Engineers.

Phase II testing at sites along the proposed transmission line at Elk River, Minnesota.

An archaeological survey of the Hannibal power line route. Dairyland Power.

1981

An archaeological survey at Viola, Wis. ETC Engineering.

Cultural resources investigation at Steuben, Wis. substation site. Dairyland Power

A cultural resources investigation at Wittenburg Park, City of La Crosse.

CTH 'OS' archaeological survey, La Crosse County.

An archaeological survey of the Sherco Benton Power Line, St. Cloud, Minnesota. Northern States Power Co.

A Phase I and Phase II study of the proposed Holmen sewer line and treatment site. Village of Holmen, Wis.

Riceford transmission line and substation, Riceford, Minnesota. Dairyland Power.

Root River Channelization Project, Houston Co., Minnesota. U.S. Corps of Engineers.

Archaeological testing of the southern end of Goose Island, Vernon Co., Wi. U.S. Corps of Engineers.

An archaeological inspection of a dredge spoil site in Trempealeau, Wis. U.S. Corps of Engineers.

Archaeological excavations (Phase I & II) of the proposed wastewater treatment site at Coon Valley, Wis. Village of Coon Valley.

#### OTHER

Participant, summer seminar and field study in Egyptian civilization and culture, Ain Shams University, Cairo, 1975

Director, Center for Research Archaeology, La Crosse, Wisconsin, 1977-1981

Board of Advisors, Institute for Minnesota Archaeology

#### HONORS AND AWARDS

Fellow, Institute for the Study of Earth and Man, Southern Methodist University, Dallas, Texas

#### MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

Wisconsin Archaeological Survey  
 Wisconsin Archaeological Society  
 Society for American Archaeology  
 Association of Iowa Archaeologists  
 Minnesota Archaeological Society  
 Society of Africanist Archaeologists in America  
 Iowa Archaeological Society

#### PUBLICATIONS AND PAPERS PRESENTED

1965 Gallagher, J.P., Michael Davis, and Fred Schneider, "Plains Indian German Silverwork in the Anadarko, Oklahoma Area". Papers in Anthropology, 6:22-40, University of Oklahoma, Norman.

1973 Gallagher, J.P., "Preliminary report on archaeological research near Lake Zuai, Ethiopia" Annales d'Ethiopie, 9:64-80, Ethiopian Archaeological Institute, Addis Ababa.

1973 Gallagher, J.P., "Ethiopian Ethnoarchaeology" paper presented at the Conference of Africanist Archaeologists, April 16, 1973, Southern Methodist University, Dallas, Texas.

n.d. Gallagher, J.P., "Ethnoarchaeology in south central Ethiopia", Proceedings of the VIIth Pan African Congress of Prehistory and Quaternary Studies, in press, Addis Ababa.

1974 Gallagher, J.P., "Preparation of hides with stone tools in south central Ethiopia", Journal of Ethiopian Studies, 13 (1):177-182, Institute of Ethiopian Studies, Addis Ababa.

- 1977 Gallagher, J.P., "Ethiopian Research", Nyame Akuma, 11:11-14.
- 1977 Gallagher, J.P., "Contemporary Stone Tools in Ethiopia: Implications for Archaeology", Journal of Field Archaeology, 4:407-414.
- n.d. Hassan, Fekri A., T.R. Hays, and J.P. Gallagher, "Recent Excavations of Predynastic Sites in the Nagada-Khattara Area, Upper Egypt", in press, Nyame Akuma.
- 1979 Gallagher, J.P., "Excavations at the Valley View Site, a fortified Oneota village near La Crosse, Wis.", paper presented at the 1979 meeting of the Society for American Archaeology, Vancouver, B.C.
- 1979 Gallagher, J.P., "The Valley View Site, An Orr Focus Village near La Crosse", paper presented at the Midwest Archaeological Conference, October 13, 1979, Milwaukee, Wis.
- 1979 Gallagher, J.P., Katherine Stevenson, and James Theler, "The Valley View Site (47Lc34), an Orr Phase Oneota Site at La Crosse, 1979 Excavations and Analysis." Technical report on file, State Historical Society of Wisconsin, Madison.
- n.d. Gallagher, J.P. and Katherine Stevenson, "Oneota Subsistence and Settlement in Southwestern Wisconsin", Minnesota Anthropological Papers I, (in press).
- 1980 Gallagher, J.P., "La Crosse Area Archaeological Survey, 1979 Season". Technical Report on file, State Historical Society of Wisconsin, Madison.
- 1980 Gallagher, J.P. and Katherine Stevenson, "Oneota Subsistence and Settlement in Southwestern Wisconsin". Paper presented at the Midwest Archaeological Conference, Oct. 5, Chicago.
- 1980 Fekri Hassan, T.R. Hays, J.P. Gallagher, et al, "Towards a Model of Agricultural Developments in Predynastic Egypt". Paper presented at the International Symposium on the Origin and Early Development of Food Producing Cultures in North-Eastern Africa, Poznan Poland, Nov. 15.
- 1980 Gallagher, J.P. and Katherine Stevenson, Preliminary Report on excavations at the Valley View Site (47Lc34), an Oneota Village near La Crosse, Wisconsin Archaeologist, vol. 61 #4.
- 1980 Fekri Hassan, T.R. Hays, J.P. Gallagher, et al, "Agricultural Developments in the Nagada, Egypt region during the Predynastic Period". Paper presented at the annual meeting of the American Research Center in Egypt, 13-15 April, San Francisco. Published in Nyame Akuma, vol. 17, 1980.
- 1980 Gallagher, J.P. and Katherine Stevenson, "The Overhead Site - - a Multicomponent Site on the Mississippi River at La Crosse." Paper presented at the Midwest Archaeological Conference, Oct. 4, Chicago.
- 1981 Gallagher, J.P., Katherine Stevenson, et al, "The Overhead Site". Technical Report on file at the State Historical Society of Wisconsin.

1982 Gallagher, J.P., Roland Rodell, and Katherine Stevenson, "The 1980-1982 La Crosse Area Archaeological Survey". Reports of Investigations Number 2, Mississippi Valley Archaeology Center, La Crosse, Wisconsin.

1982 Gallagher, J.P. and Robert Boszhardt, "The Dahl Site". Reports of Investigations Number 1, Mississippi Valley Archaeology Center, La Crosse, Wisconsin.

## VITAE

ROBERT F. BOSZARDT

PII Redacted

AREA OF INTEREST: Prehistoric Adaptations and Cultural Change in the Upper Mississippi River Valley and Western Upper Great Lakes.

ACADEMIC HISTORY: University of Wisconsin-Waukesha Center, 1972-1974.  
University of Wisconsin-Milwaukee, Bachelor of Arts,  
Anthropology, 1977  
University of Wisconsin-Madison, Master of Arts,  
Anthropology, 1982

MEMBERSHIP IN PROFESSIONAL SOCIETIES AND ORGANIZATIONS

The Iowa Archaeological Society  
The Galena Historical Society  
Wisconsin Archaeological Society (Advisory Council)  
Iowa Historical Society  
La Crosse Area Archaeological Society  
Wisconsin Archaeological Survey  
Minnesota Archaeological Society

PAPERS PRESENTED

- 1981 The Prairie Phase, an "Early Woodland" Manifestation in the Upper Mississippi River Valley. Midwest Archaeological Conference, Madison, Wisconsin. Junior participant with Dr. James Stoltman and James L. Theler. Paper delivered by Dr. James Stoltman.
- 1981 Preliminary Report on an Archaeological Survey of Pool 12, Upper Mississippi River. Midwest Archaeological Conference, Madison, Wisconsin.
- 1981 Report and Discussion of Archaeological/Geomorphological Interpretations of Pool 12 in the Upper Mississippi River Valley. Wisconsin Archaeological Society, November meeting, Waukesha, Wisconsin.
- 1982 The La Crosse Area Archaeological Society's Excavations at the Dahl Site. La Crosse Area Archaeological Society, September meeting, La Crosse, Wisconsin.
- 1983 Archaeology and Benthology: Do These Fields Share Common Interests? 31st Annual Meeting of the North American Benthological Society, April 27, La Crosse, Wisconsin.



- 1983 A Comparison of the Floodplain Archaeology of Navigation Pools 7 and 8 at La Crosse with pools 10, 12, and 16 of the Upper Mississippi River. Midwest Archaeological Conference, Iowa City, Iowa.

#### PUBLICATIONS

- 1977 Radiocarbon Dates for Wisconsin, 1976, A Second Compilation. The Wisconsin Archeologist, 58(2):84-150.
- 1982 Wisconsin Radiocarbon Update: 1981, The Wisconsin Archeologist, Vol. 63 (2).
- 1983 Ridged Fields at the Sand Lake Site Near La Crosse, Wisconsin. Minnesota Archaeological Newsletter, No. 30.
- 1983 Prehistory of the Upper Mississippi. In The River Revival. Mississippi River Revival, Inc., Minneapolis, Minnesota.
- 1983 Preliminary Investigations: Archaeology and Sediment Geomorphology, Navigation Pool 12, Upper Mississippi River. The Wisconsin Archeologist, 64 (2). Senior author with David F. Overstreet.

#### TECHNICAL REPORTS

- 1981 Archaeological Investigations on Private Lands in the Lowland Floodplain near Prairie du Chien, Wisconsin. State Historical Society of Wisconsin. Section of Comprehensive Report on Archaeological Investigations of the Prairie du Chien locality, Crawford County, Wisconsin, prepared by Dr. James B. Stoltman, James L. Theler, Constance Arzigian and Jeff Behm.
- 1981 Preliminary Investigations: Archaeological and Sediment Geomorphology, Navigation Pool 12, Upper Mississippi River. Great Lakes Archaeological Research Center, Reports of Investigations No. 115 (3 volumes). Senior author with Dr. David Overstreet.
- 1982 Archaeological Investigations in the Lowland Floodplain of Navigation Pool 10 near Prairie du Chien, Crawford County, Wisconsin. Master's Thesis, University of Wisconsin-Madison, Department of Anthropology.
- 1982 Archaeological Investigations at The Dahl Site (47Lc148), Mississippi Valley Archaeology Center, Inc. Reports of Investigations No. 1. Senior author with Dr. James P. Gallagher.

-3-

- 1982 Archaeological Testing and Evaluation of 11Jdl26. Addendum to Preliminary Investigations: Archaeology and Sediment Geomorphology, Navigation Pool 12, Upper Mississippi River. Great Lakes Archaeological Research Center Reports of Investigations Number 115. Senior author with David F. Overstreet.
- 1983 Cultural Resources Reconnaissance Inventory of Portions of the Eau Galle Recreation Area, St. Croix County, Wisconsin. Mississippi Valley Archaeology Center Reports of Investigations Number 3.
- 1983 Cultural Resources Reconnaissance Inventory of Portions of the Eau Galle Recreation Area, St. Croix County, Wisconsin. Mississippi Valley Archaeology Center Reports of Investigations Number 4, and Addendum.
- 1983 Test Excavations at the Leon Site (47Lc49). Mississippi Valley Archaeology Center, Reports of Investigations Number 5.
- 1983 Phase II Cultural Resources Inventory and Evaluation at 47Bf131 in Bluff Siding, Buffalo County, Wisconsin. Mississippi Valley Archaeology Center Reports of Investigations Number 16.
- 1983 Cultural Resources Inventory of Planned Site of Cochrane State Branch Bank at Bluff Siding, Buffalo County, Wisconsin. Mississippi Valley Archaeology Center Reports of Investigations Number 13.
- 1983 Cultural Resources Investigations: Survey of Portions of the State Road and Ebner Coulee Project, La Crosse County, Wisconsin. Mississippi Valley Archaeology Center Reports of Investigations Number 11.
- 1983 Cultural Resources Investigations of Two Sections of a Proposed Gas Main in La Crosse County, Wisconsin. Mississippi Valley Archaeology Center Report of Investigations Number 14.
- 1983 Phase II Cultural Resources Inventory and Evaluation of a Proposed Realignment of a Segment of CTH "SN" in La Crosse County, Wisconsin. Mississippi Valley Archaeology Center Reports of Investigations Number 15.

ARCHAEOLOGICAL FIELD/LABORATORY EXPERIENCE

- 1973 Crew member, Archaeological Field School, Hixton Quarry Site, University of Wisconsin-Waukesha. Dr. David F. Overstreet, Director.
- 1974 Crew member, Byron Power Plant Project, First and Second Phase Testing, University of Wisconsin-Milwaukee. Robert Birmingham, Director.

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- 1975 Crew member, Apostle Island Survey, Beloit College. Dr. David F. Overstreet, Director.
- 1975 Crew member, Marina Site Excavation, Madeline Island, Wisconsin, Beloit College. Robert Birmingham, Director.
- 1975-1976  
Lithic Analysis, Apostle Island Survey, Beloit College. Dr. David F. Overstreet, Director.
- 1976 Crew member, Jones Bluff Survey (Alabama River), Office of Archaeological Research, University of Alabama. C. Oakly and M. Watson, Directors.
- 1976 Crew member, Subassistant, Phipps Bend Excavations (Tennessee), Office of Archaeological Research, University of Alabama. Robert Lafferty, Director.
- 1976 Crew member, Rock River Survey (Rock Island County, Illinois), University of Wisconsin-Milwaukee. Robert Birmingham, Director.
- 1977 Crew member, Historic Site Survey, Fox River Watershed, Waukesha County, Wisconsin. Dr. David F. Overstreet, Director.
- 1977-1979  
Research Assistant, the Great Lakes Archaeological Research Center, Waukesha, Wisconsin. Project participation included:
- Archaeological Inventory and Evaluation of Weston, Unit 3 Power Plant, Marathon County, Wisconsin.
  - Archaeological Inventory of the Sanitary Sewer Collection System and Waste Disposal Treatment Facility: Town of Norway Sanitary District No. 1, Racine County, Wisconsin.
  - Archaeological Inventory and Evaluation of the Proposed Sewage Treatment Facilities at Mukwanago, Waukesha County, Wisconsin.
  - An Archaeological Inventory and Evaluation: The Proposed Waukesha County Technical Institute Expansion Project.
  - An Intensive Archaeological Survey, Milan-Big Island Phase II Study, Rock River, Illinois.
  - Archaeological Inventory and Evaluation: Brillion, Wisconsin Wastewater Treatment Facilities.
  - Archaeological Inventory and Evaluation of Butte des Morts Utility District, Menasha (West).

-Cultural Resource Inventory of the Chippewa River in Sawyer County, Wisconsin.

-Cultural Resources Reconnaissances, Loves Park, Illinois, Interim 2, Flood Feasibility Study.

-Archaeological Inventory of the Sand Hill Estates and Hillside Homes Community, Oneida, Outagamie County, Wisconsin.

-Archaeological Inventory of the Proposed Stabilization Ponds, Lift Station and Interceptor Route, Mellen, Wisconsin.

-Archaeological Inventory of the Cherryland Airport Extension, Door County, Wisconsin.

-Archaeological Inventory of the Proposed Realignment of County D, Florence County, Wisconsin.

-Cultural Resource Evaluation of the Sturgeon River Wilderness Study Area, Ottawa National Forest.

-Archaeological Inventory of the Proposed Outagamie Airport Industrial Park Site.

-Cultural Resource Evaluation of Two Chequamegon National Forest Wilderness Study Areas: Flynn and Round Lakes.

-Archaeological Inventory and Evaluation of the Proposed Wastewater Treatment Facilities at Cambellsport, Fond du Lac County, Wisconsin.

-Archaeological Inventory and Evaluation of the Proposed Dredging Deposition Areas at Muskego, Wisconsin.

-Initial Archaeological Inventory of Chequamegon National Forest in Northwestern Wisconsin.

-Archaeological Inventory and Evaluation of the Proposed Wastewater Treatment Facilities at Columbus, Wisconsin.

-Archaeological Inventory of the Proposed Wisconsin Public Service Corporation Ash Disposal Site, Brokaw, Marathon County, Wisconsin.

-Cultural Resource Inventory and Evaluation of the Proposed Expansion of the Wastewater Treatment Facilities at Monroe, Green County, Wisconsin (Field Supervisor).

-Archaeological Inventory of the Proposed Electrical Power Service Line from Prairie du Chien to Indian Isle, Crawford County, Wisconsin (Field Supervisor).

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- Archaeological Inventory and Evaluation of the Proposed Wastewater Treatment Facilities at Friesland, Columbia County, Wisconsin.
  - Archaeological Inventory of the Proposed Hidden Harbor Development at Fish Creek, Door County, Wisconsin.
  - Salvage Excavations at the Convent Knoll Site (47Wk327), a Red Ochre Cemetery at Elm Grove, Waukesha County, Wisconsin.
  - Archaeological Excavation at the Mile Long Site (47W1110), Lake Delevan, Walworth County, Wisconsin.
  - Archaeological Inventory and Evaluation of the Proposed Wastewater Treatment Facilities at Boscobel, Grant County, Wisconsin.
  - Archaeological Inventory of the Proposed Wastewater Treatment Facilities at Palmyra, Jefferson County, Wisconsin.
  - Archaeological Recovery at 11Ri337, an Early Middle Woodland Shell Midden in East Moline, Illinois.
  - Cultural Resources and Assessment: Butternut and Franklin Lakes, Nicolet National Forest.
  - Archaeological Survey of the East Shore of Lake Winnebago: 1979.
  - Archaeological Survey of the Green Bay Coastal Corridor (Field Supervisor).
  - A Cultural Resource Survey of Proposed Undertakings Nicolet National Forest, Wisconsin.
- 1980 Research Assistant, University of Wisconsin-Madison, Laboratory of Archaeology. Project participation included:
- Archaeological Investigations in the Prairie du Chien Locality, Crawford County, Wisconsin.
  - Supervisor, University of Wisconsin-Madison, Field School in Archaeology.
  - Archaeological Investigations on Private Lands in the Lowland Floodplain of the Upper Mississippi River near Prairie du Chien, Wisconsin.

-7-

1981 Research Assistant, the Great Lakes Archaeological Research Center, Waukesha, Wisconsin. Project participation included:

-Archaeological Testing of an Early Logging Camp (47Fr142) Forest County, Wisconsin.

-A Cultural Resource Survey at Kinickinic State Park, Pierce County, Wisconsin.

-Archaeological Survey of Pool 12, Upper Mississippi River Valley (Field Supervisor).

-Archaeological Testing of Two Prehistoric Sites (47Fr141, 47Fr143), at Oak Lake in Northcentral Wisconsin.

1982 Field Director. Archaeological Investigations at The Dahl Site (47Lc148), La Crosse County, Wisconsin.

1982 Co-Field Director. Archaeological Survey and Excavations at the Sand Lake Site (47Lc44), La Crosse County, Wisconsin.

1982 Field Director. La Crosse County Archaeological Survey, 1982.

1982 Field Director. Archaeological Survey at the Eau Galle Reservoir, St. Croix County, Wisconsin.

1983 Co-Field Director. La Crosse Area Archaeological Survey.

Field Director. Archaeological Excavations at the Pammel Creek Site (47Lc61), La Crosse County, Wisconsin. This project involved three phases: contract mitigation, a high school field school, and an adult public field school.

Field Director. Phase I survey at the mouth of State Road Coulee for the State Road and Ebner Coulee flood control project, La Crosse County, Wisconsin.

Field Director. Phase I survey for the Cochrane State Branch Bank at Bluff Siding, Buffalo County, Wisconsin.

Field Director. Phase II testing for Cochrane State Branch Bank at Bluff Siding II Site (47Bf131), Buffalo County, Wisconsin.

Field Director. Phase I survey for Northern State Power of two sections of a proposed gas main in La Crosse County, Wisconsin.

Field Director. Phase II testing at four prehistoric sites along CTH "SN" in La Crosse County, Wisconsin.

CURRICULUM VITA

James L. Thaler

[PII Redacted]

[REDACTED]

Graduated High School, 1965  
U.S. Air Force 1966-1970

[REDACTED]

[REDACTED]

University: Office of the State Archaeologist  
Eastlawn Building  
The University of Iowa  
Iowa City, Iowa 52242  
Telephone (319) 353-5175

## RESEARCH INTERESTS:

Archaeology of eastern North America (especially Upper Midwest)  
Prehistoric subsistence and settlement patterns; faunal analysis  
(vertebrate and invertebrate)  
Paleoclimatic and paleoenvironmental reconstruction  
Archaeological survey techniques and excavation methods

## EDUCATION:

1971-1975 University of Cincinnati  
B.A. Anthropology (cum laude), 1975

1975-1983 University of Wisconsin-Madison  
M.A. Anthropology, 1978. Thesis title: The vertebrate  
faunal remains from Sand Ridge (33Ha17): A stratified  
habitation site in southwestern Ohio.

University of Wisconsin-Madison  
Ph.D. Anthropology, 1983. Dissertation  
title: Woodland Tradition Economic Strategies:  
Animal Resource Utilization in Southwestern  
Wisconsin and Northeastern Iowa.

Minor: Environmental Studies--distributed minor

## FIELD EXPERIENCE:

1983 Directing phase II excavations at 16 prehistoric archaeological  
sites in east central Iowa for Office of the State Archaeologist,  
University of Iowa.

1980 Teaching assistant, University of Wisconsin-Madison Summer Field  
School. Co-directed excavation at Mill Pond site, an Early  
Woodland extractive site in Crawford County, Wisconsin.

- 1979-1980 Archaeological site survey, Crawford County, Wisconsin; University of Wisconsin-Madison. Survey covered a transect from the Mississippi River floodplain to the uplands. Principal investigator, upland survey; field director, bottomland survey.
- 1978 Teaching assistant, University of Wisconsin-Madison Summer Field School. Survey and testing, Crawford County, Wisconsin.
- 1977 Co-director, excavations at Sand Ridge site, Hamilton County, Ohio (Fort Ancient component). Cincinnati Museum of Natural History.
- 1976 Teaching assistant, University of Wisconsin-Madison Summer Field School. Systematic surface collection and block excavation of the Bass site, an early Archaic quarry site in Grant County, Wisconsin.
- 1975 Co-director, excavations at Sand Ridge site, Hamilton County, Ohio. Cincinnati Museum of Natural History.
- 1974 Teaching assistant, University of Cincinnati Summer Field School. Excavations at Bullskin Creek site, a late Archaic site in Clermont County, Ohio.
- 1973 Teaching assistant, University of Cincinnati Summer Field School. Excavations at Logan site, a late Archaic site in Clermont County, Ohio.
- 1972 Teaching assistant, University of Cincinnati Summer Field School. Excavations at Maple Creek site, a late Archaic site in Clermont County, Ohio.
- 1971 Student, University of Cincinnati Summer Field School. Excavation of Maple Creek site, Clermont County, Ohio.
- 1971 Conducted archaeological site survey, Clermont County, Ohio. University of Cincinnati.
- 1972-present Principal investigator, crew member. Various short-term contract survey, testing, and excavation projects in Ohio and Wisconsin.

## ADDITIONAL RESEARCH EXPERIENCE:

- 1982 Consultant, Soil Conservation Service, U.S. Department of Agriculture. The utilization of molluscan fauna for environmental and climatic reconstruction of buried Holocene deposits in western Iowa. Dean M. Thompson, principal investigator.



- 1980-1981 Project assistant, Department of Anthropology, University of Wisconsin-Madison. Analyzed material from 1980 field season excavation and survey in Crawford County, Wisconsin.
- 1976-1977 Project assistant, Department of Anthropology, University of Wisconsin-Madison. Gastropod analysis, Rodgers Shelter, Benton County, Missouri.
- 1974-present Faunal analysis (consultant). Identification and analysis of vertebrate fauna, naiads, and gastropods from various sites in the Upper Midwest.

## TEACHING EXPERIENCE:

- 1981-1982 Teaching assistant, Department of Anthropology, University of Wisconsin-Madison. Anthropology 100, Introduction to Anthropology.
- 1980, 1978, 1976 Teaching assistant, University of Wisconsin-Madison Summer Archaeological Field School. See also Field Experience.
- 1974, 1973, 1972 Teaching assistant, University of Cincinnati Summer Archaeological Field School. See also Field Experience.

## GRANTS, FELLOWSHIPS:

- 1983 (summer) Post-doctoral fellowship from the Center for Climatic Research, University of Wisconsin-Madison. Research objectives involved use of subfossil gastropods from archaeological sites as indicators of paleoclimates/environments.
- 1979 Grant from the Office of Archaeology and Historic Preservation, U.S. Department of the Interior, HSI-771 for archaeological survey in southwestern Wisconsin.

## PUBLICATIONS:

- n.d. The Early Woodland component at Mill Pond (47Cr186): subsistence and cultural content. Accepted for publication, Center for American Archeology Research Volume: The Kampsville Conference on Early Woodland.
- n.d. Additional seasonality data for the Millville Site (47Gt53): evidence from white-tailed deer mandibles aged by dental eruption (E. Elizabeth Pillaert). Accepted for publication, The Wisconsin Archeologist.
- n.d. Habitat and climatic interpretation from terrestrial gastropods at Rodgers Shelter (with David A. Baerreis). Accepted for publication, Illinois State Museum Scientific Series.

- n.d. The terrestrial gastropods at Modoc Rock Shelter (11Ra501): environmental and climatic implications (with David A. Baerreis). Accepted for publication, Illinois State Museum Reports of Investigations.
- 1982 Gastropod Analysis. Appendix D, Environmental Data, pp. 213-217. In: Chan-ya-ta: A Mill Creek Village by Joseph A. Tiffany. Report 15. Office of the State Archaeologist of Iowa.
- 1981 An archaeological survey of Mill Coulee and the adjacent uplands of Crawford County, Wisconsin, 1979. The Wisconsin Archeologist 62(2):168-205.
- 1981 Faunal remains from Bluff Siding (47Bf45), Buffalo County, Wisconsin. The Wisconsin Archeologist 62(1):33-44.
- 1980 Archaeological recovery at 11Ri337, an early Middle Woodland shell midden in East Moline, Illinois (with Allen P. Van Dyke and David F. Overstreet). The Wisconsin Archeologist 61(2):125-256.

## UNPUBLISHED REPORTS:

- 1982 Climatic Inferences Derived from the Archaeological Remains of Rice Rat (Oryzomys palustris) in the American Midwest (with Kent D. Vickery and Orrin C. Shane III). Submitted for publication to American Antiquity. A version of this report was presented at the Midwest Archaeological Conference, Madison, Wisconsin, in 1981.
- 1980 A report on the 1979-80 archaeological survey activities conducted in the Upper Mississippi River Wildlife and Fish Refuge, Pool 10, Crawford County, Wisconsin (with James B. Stoltman). Submitted to U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C.
- 1980 Initial interpretation of the gastropod assemblage recovered at 13PK149, Polk County, Iowa. Report on file, Department of Anthropology, University of Wisconsin-Madison.
- 1979 Faunal remains from Preston Rock Shelter (47Gt157), Grant County, Wisconsin. Report on file, Department of Anthropology, University of Wisconsin-Madison.
- 1979 The Valley View site (47Lc34), an Orr Phase Oneota site at La Crosse: 1978 excavations and analysis (with James P. Gallagher and Katherine Stevenson). Report prepared for the State Historical Society of Wisconsin.

- 1978 Lithic raw material utilization in southwestern Ohio and its relevance to raw material exchange in the region's prehistory. Report on file at the University of Cincinnati Department of Anthropology.
- 1975 An intensive archaeological survey in the Ohio River Valley of Clermont County, Ohio, 1971-74. Report on file at the Department of Anthropology, University of Cincinnati.
- 1974-present Numerous small reports on faunal identifications and analysis, for various sites in the Upper Midwest.

## PROFESSIONAL PAPERS:

- 1983 Middle Woodland Summer Subsistence Patterns in the Prairie du Chien locality: faunal remains. Presented at the Midwest Archaeological Conference, Iowa City, Iowa.
- 1983 Woodland subsistence patterns and the dietary importance of freshwater mussels. Presented at the 48th Annual Meeting of the Society for American Archaeology, Pittsburgh, Pennsylvania.
- 1981 Comments on erosion and archaeological site destruction in the Prairie du Chien area of Pool 10. Presented at the Midwest Archaeological Conference, Madison, Wisconsin.
- 1981 The Prairie Phase, an "Early Woodland" manifestation in the Upper Mississippi Valley (with James B. Stoltman and Robert F. Boszhardt). Presented at the Midwest Archaeological Conference, Madison, Wisconsin.
- 1980 Animal resource utilization by Late Woodland groups in southern Ohio: a perspective from Sand Ridge (33Hal7). Presented at the Midwest Archaeological Conference, Chicago, Illinois.
- 1980 The 1980 archaeological investigations at the Mill Pond site, a Woodland extractive camp in Crawford County, Wisconsin (with Constance M. Arzigian). Presented at the Midwest Archaeological Conference, Chicago, Illinois.
- 1977 A preliminary report on the gastropods from the Dupont site, 33Hall. Presented at the Annual Meeting of the Central States Anthropological Society, Cincinnati, Ohio.
- 1974 Chert utilization at the Ferris site, 33Ct31, an Early Archaic camp in southwestern Ohio (with Timothy S. Dalbey). Presented at the Ohio Valley Archaeological Conference, Tullahoma, Tennessee.

## SOCIETY MEMBERSHIPS:

Society for American Archaeology  
American Anthropological Association  
The Plains Conference  
Society of Ethnobiology  
Wisconsin Archeological Society  
Iowa Archeological Society  
American Malacological Union

APPENDIX D  
CORRESPONDENCE

November 26, 1983

Mr. Robert F. Boszhardt, Staff Archaeologist  
Mississippi Valley Archaeological Center, Inc.  
1723 State S t.  
LaCrosse, Wisconsin 54601

Dear Mr. Boszhardt,

The plant specimens from the Pammel Creek site (47 LC 61) are being returned to you today by first class mail. Enclosed with this letter is a list of what identifications I could make and a summary. Uncarbonized seeds and items on which I was unable to make an identification have each been placed in separate, labelled capsules and attached to the other material from the feature and level from which they came.

Corn kernels or cobs or fragments were present in 16 of 84% of the 19 features from which plant materials were recovered. Only Features 37, 45 and possibly 46 contained no remains of corn. Seven, measurable corn cob cupules were present in Features 7, 24, 40 and 49. They consisted of three from 8-rowed ears, three from 10-rowed ears and one from a 12-rowed ear. Most appear to be of the Eastern Eight Row race. 10-rowed ears are occasionally present in samples of this race and 12-rowed less commonly. The cupule from a 12-rowed ear, if not from an ear tip, may possibly represent survival of an earlier hard flint or popcorn variety.

The small piece of gourd rind (Lagenaria siceraria) in Feature 4 was positively identified by comparison with a carbonized sample in our reference collection.

~~Some~~ Distinctive fragments, which I was unable to identify turned up in Features 7, 9, 13, 24 and 49. It was suggested by one qualified person to whom one was shown that they might be part of a tree fungus. This was more of an educated guess than an identification.

Uncarbonized seeds were present in all but three features, numbers 1, 35 and 40. Such seeds may occur due to action of insects and animals, as you pointed out in your letter. They also are commonly present from the natural seed rain on sites which are excavated during the seeding time of nearby plants.

Cost of mailing the specimens back to you was \$4.15. Since there is a \$3.00 credit left from the check that you sent earlier, there is only \$1.15 still due me.

Sincerely,

*Leonard*

Leonard W. Blake

Box 1114, Dept. of Anthropology  
Washington University  
St. Louis, Mo. 63130

Enclosure

SUMMARY OF OCCURRENCE OF VARIOUS PLANT REMAINS BY FEATURE  
 PAMMEL CREEK SITE (47 LC 61) (Carbonized, unless otherwise noted).

Feature No.	No. Samples	Corn		Common Bean	Gourd Rind	Hickory Nut	Black Walnut	Sumac	Dock	Wild Plum	Blackberry*	Goosefoot	Pig Weed	Bullrush	Wood Charcoal	Uncarbonized Seeds	Un-Identified Seeds	Material
Fea.		Kernels	Cob															
1	1		1						1						1			
2	10	8	3					1	1				?		1	2	3	5
3	1	1				1										1		1
4	4	4	3		1				1						1	2		1
5		1	2													3		
7	7	3	3			3	1								2	3	2	3
9	8	3	2												1	2	2	3
10	2	1	1												1	1	1	1
11	4	1									1					4	3	1
13	3	3	3			2		1		1						2	1	1
24	6	3	4	1		3	1	1		1						1	3	2
26	2	1	2												1	1	1	2
35	3		2														1	1
37	2															1		1
40	7	4	5									?	?				1	3
41	2	1				?										1	1	
45	1															1		1
46	1		?													1		1
49	3	3	3									1		1		2	3	1

Out of 19 features, kernels occurred in 14, cobs in 13; kernels or cobs occurred in 16 or 84%.

Beans occurred in 1, gourd in 1, hickory nut in 4, black walnut in 3, dock in 3, sumac in 3, wild plum in 2, goosefoot in 1, bullrush in 1 and pig weed possibly in 1 or 2. Wood charcoal was in 7, uncarbonized seeds in 16, unidentified seeds in 12 and unidentified material in 16.

\* Uncarbonized

1.

PANMEL CREEK SITE (47 LC 61) CARBONIZED  
Received Sept. 21, 1983 from R.C. Boszhardt, Mississippi Valley  
Archaeological Center, LaCrosse, Wisconsin 54601

Provenience  
and Catalog No.

Weight  
in grams

Fea. 1, L. 1, 83-37

Several pieces of broken corn cob cupules less than 0.01  
(A cupule is the pocket in the central axis of the cob in which  
a pair of spikelets, each usually producing a single grain (kernel)  
is borne.)

Several small pieces of wood charcoal less than 0.01

77 seeds of dock (*Rumex* sp.), less than 2 mm. long " " 0.01

1 unidentified seed 0.6 X 1.9 mm.

Several small, unidentified fragments.

Uncarbonized seeds, which are presumed to be modern.

Fea. 2, L. 2, 83-494

One small piece of corn kernel.

One seed of *Rumex* sp.

Unidentified seeds:

Four 0.7 X 2.0 mm.

One 0.7 X 1.3 mm.

One heavily carbonized 0.9 X 1.1 mm.

Fea. 2, L. 3, 83-497

One corn kernel from an 8-rowed ear, 7.6 mm. wide, 4.0 mm. thick,  
germ missing and one broken corn cob cupule, closed cupule,  
row number could not be determined.

0.02

Unidentified seeds:

One 1.2 X 2.4 mm.

Three different, 1.0 to 1.5 mm long.

Two seeds less than 1.0 mm., heavily carbonized, possibly

*Amaranthus* sp.

Uncarbonized seeds.

Fea. 2, L. 4, 83-500

Two pieces of a small nutlet, 2.8 X 3.8 mm, hollow, possibly  
hawthorn (*Crataegus* sp.)

Broken cupules and other cob fragments

0.03

Small spherical objects less than 0.5 mm. in diameter.

These appear to be non-botanical mineralized spheres.

Fea. 2, L. 5, 83-502

One small, broken corn cob cupule and numerous fragments of  
corn kernels.

0.22

One unidentified fragment.

One small piece of bone.

Fea. 2, L. 6, 83-516

Broken corn kernels. Two that were measurable were 6.9 and  
8.6 mm. wide.

0.56

One seed of sumac (*Rhus* sp.), 2.5 X 3.3 mm.

One piece of unidentified material. Possibly part of some fungus.

This is not a positive identification.



## PAMMEL CREEK SITE (47 LC 61) CARBONIZED (Continued) 2.

Fea.2,L.7,83-510

Four small pieces of corn kernels Less than 0.01 g  
 One unidentified fragment and two unidentified, broken seeds.

Fea.2,L.<sup>8</sup>83-513

Corn kernel fragments 0.01  
 Two very small pebbles.

Fea.2,L.9,83-519

Corn kernel fragments 0.04

Fea.2, L.11, HF, 83-525

One small piece of wood charcoal Less than 0.01  
 Two small, unidentified fragments.  
 Two uncarbonized, modern seeds.

Fea.2,L.12,83-527

One small piece of corn kernel.  
 Several small, unidentified fragments.

Fea.3,L.1,83-488

Corn kernel fragments. 0.02  
 Two small pieces of hickory nut shell 0.05  
 Small, unidentified fragments - some may not be parts of seeds.  
 Uncarbonized, modern seeds.

Fea.4,L.1,83-47

Very small pieces of corn cob and kernels less than 0.01  
 One small piece of wood charcoal.  
 Uncarbonized seeds.

Fea.4,L.2,83-49

One piece of corn kernel, 6.6 mm. wide 0.03  
 One small fragment of ~~possible~~ gourd rind (Lagenaria siceraria)  
 One small piece of dirt.

Fea.4,L.3,83-51

One bloated corn kernel, 8.9 mm. wide, one small piece of  
 corn kernel and one small piece of corn cupule. 0.12  
 Three seeds of dock (Rumex sp.)  
 Unidentified carbonized fragments.

Fea.4, General fill, 83-39

One broken corn kernel, two broken cupules and fragments of  
 kernels and cobs. 0.10  
 Uncarbonized modern seeds and non-botanical material.

Fea.5, L.1 and 2, 83-54

Two small pieces of cupules and one of corn kernel less than 0.01  
 Uncarbonized, modern seeds.

Fea.5,L.2,83-56

One small piece of corn cob glume less than 0.01  
 Uncarbonized, modern seeds.

## PANEL CREEK SITE (47 LC 61) CARBONIZED (Continued)

3.

Fea.5,L.5,83-53

Pieces of non-botanical shell.  
Uncarbonized, modern seeds.

Fea.7,L.1,83-62

One closed cupule from a 10-rowed ear, cupule width 7.1 mm.,  
broken cupules and a few pieces of corn kernels  
One piece of unidentified material as in Fea.2, L.6.  
Uncarbonized, modern seeds.

6.13 gr

Fea.7,L.2,83-64

Two pieces of hickory nut shell (*Carya* sp.)  
One piece of black walnut shell (*Juglans nigra*)  
One small piece of wood charcoal  
Uncarbonized, modern seeds.

less than

0.07

0.06

0.01

Fea.7,L.3,83-70

Nine pieces of hickory nut shell  
Three pieces of non-botanical bone.

0.43

Fea.7,L.4,83-74

One corn kernel and fragments and small, broken cupule  
Two small pieces of wood charcoal  
One small, unidentified, carbonized fragment and broken,  
unidentified, carbonized seeds.  
Small pieces of bone.

0.05

less than 0.01

Fea.7,L.5,83-75

One corn kernel 9.0 mm. wide and dirt

0.06

Fea.7,L.7,83-78

Two very small pieces of non-botanical bone

Fea.7, Soil profile,83-82.

One closed cupule from an 8-rowed ear, cupule width 7.8+ mm.,  
broken and two small pieces of cupules  
Three small pieces of hickory nut shell  
One unidentified seed fragment and unidentified material  
as in Fea.2, L.6.  
Uncarbonized modern seeds and non-botanical items.

less than

0.01

0.07

Fea.9,L.1,83-91 LF

Small fragments of corn cob and kernels  
Three, small, unidentified carbonized seeds.  
Uncarbonized, modern seeds.

0.03

Fea.9,L.2,83-97 LF

One small piece of corn kernel  
Four small, unidentified fragments. Three of these are like  
that in Fea.2,L.6.

less than 0.0

Fea.9,L.3,83-101

Two very small, less than 1 mm., unidentified fragments.

Fea.9,L.4,83-104

One very small, unidentified fragment - possibly bone.

## PAMMEL CREEK SITE (47 LC 61) CARBONIZED (Continued)

4.

Fea.9,L.4,83-108

One corn kernel 8.5 mm. wide and one cupule from an 8-rowed ear, 6.2+mm. wide, closed, broken.

0.04 gr.

Three pieces of wood charcoal

0.24

F.9,L.6,83-111

Three pieces of unidentified, broken seeds.

One piece of uncarbonized, modern seed.

F.9,L.7,83-114 LF

One small piece of unidentified material as in Fea.2,L.6.

Fea.9, Profile,83-116

One piece of non-botanical bone.

Fea.10,L.1,83-121

One piece of corn kernel and one piece of broken cupule. less than 0.01

Four pieces of unidentified carbonized material.

One unidentified broken seed and two unidentified seeds less than 1 mm. in diameter.

Uncarbonized, modern seeds.

Fea.10, b2, 83-122-33

Wood charcoal

0.96

Fea.11,L.1,83-125

One broken unidentified seed.

One uncarbonized seed of blackberry or raspberry (Rubus sp)

This kind of seed sometimes lasts for a long time in the soil and may or may not be modern.

Other uncarbonized seeds that are probably modern and objects which appear to be insect pupa (?).

Fea.11L.2,83-128

Four broken pieces of unidentified, carbonized seeds.

Uncarbonized, modern seeds and non-botanical items.

Fea.11,L.3,83-131

One unidentified seed, broken and carbonized.

Two unidentified fragments.

Two uncarbonized, modern seeds.

Fea.11,L.4,83-134

Two small pieces of corn kernels.

Uncarbonized, modern seeds.

Fea.13,L.1,83-141

One stone of wild plum 13.3x9.6 X 6.2 mm. (Prunus americana)

0.23

Four small pieces of hickory nut shell

0.06

Three small pieces of corn cob cupule and five small pieces of corn kernels. less than

0.01

Uncarbonized, modern seeds.

## PAMMEL CREEK SITE (47 LC 61) CARBONIZED (Continued)

5

Fea. 13, L. 2, 83-145

Small pieces of broken corn kernels and cob

0.03 gr

Eight pieces of hickory nut shell

0.43

One seed of sumac (Rhus sp.)

Three small pieces of unidentified material as in Fea. 2, L. 6.

One unidentified seed 1.5 X 2.0 mm.

Uncarbonized, modern seeds.

Fea. 13, L. 3, 83-148

One very small piece of corn kernel and small fragment of cob.

less than 0.01

Uncarbonized, modern seeds.

Fea. 16, L. 1, 83-258

Label in vial reads "No seeds".

Fea. 24, L. 1, 83-290

Three corn kernels 7.0, 9.1 and 10.0 mm. wide and one cupule from an 8-rowed ear 6.5 mm. wide.

0.24

One small piece of corn stalk

0.04

One seed of sumac (Rhus sp.)

Black walnut shell

0.13

Four unidentified seeds of three different kinds.

Unidentified carbonized material.

Dirt and uncarbonized seeds.

Fea. 24, L. 2, 83-630

Pieces of corn kernels, cupules and other fragments of corn cobs, one cupule is from 10-rowed ear, is fairly open and 8.1 mm. wide.

0.08

Pieces of hickory nut shell

0.07

Four pieces of unidentified material as in Fea. 2, L. 6. and broken, unidentified seed

0.02

Unidentified, carbonized fragments, some may be heavily carbonized pieces of corn cob

0.15

Fea. 24, L. 3, 83-295

Two fragments of corn kernels, corn cob fragments which include one cupule from a 12-rowed ear, 5.5 mm. wide and one from a 8-rowed ear 7.0 mm. wide.

0.43

Four unidentified seeds of three different kinds. less than

0.01

One small piece of nut shell (species? possibly hickory).)

Fea. 24, L. 4, 83-296.05-07

Three pieces of hickory nut shell

0.06

Fea. 24, 83-387! ScrappingsBroken half of common bean (Phaseolus vulgaris) 9.2 X 7.5 mm.

0.04

## PAMEL CREEK SITE (47 LC 61) CARBONIZED (Continued)

6.

Fea.24, Profile.83-397.34-45.

One corn cob cupule, row number (?), 8.7 mm. wide and one piece of corn husk	0.02
Five pieces of hickory nut shell	0.20
Two pieces of nut meats	0.04
Four pieces of plum stone ( <u>Prunus</u> sp)	0.12

Fea.26,L.2,83-302

Small, unidentified fragments, some appear to be heavily carbonized parts of corn cobs	less than 0.01
Uncarbonized and non-botanical items,	

Fea.26,L.3,83-306

Four small pieces of corn kernel and one of corn cupule	less than 0.01
Three small pieces of wood charcoal	" " 0.01
Small, heavily carbonized unidentified fragments and one seed 3.0 X 3.6mm	

Fea.?,L?,83-309.78

One piece of corn kernel	0.06
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Fea.35,L.1,83-352

Broken corn cupules and glumes	0.17
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Fea.35,L.2,83-355.

Unidentified material - possibly carbonized rotted pieces of corn shank or stalks.	
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Fea.35,L.3,83-361

Corn cob fragments	0.05
Unidentified, small seeds.	

Fea.37,L.1,83-365

Two pieces of unidentified, carbonized material	
A few uncarbonized, modern seeds.	

Fea.37,L.3,83-371

no seeds.	
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Fea.40,L.2,83-385

One piece of broken corn kernel and two broken corn cupules	0.02
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Fea.40,L.2,83-389

One cupule, probably 8-rowed, closed, 8.0+ mm. wide and broken cupules and kernel fragments	0.07
Unidentified material and seeds	less than 0.01

Fea.40,L.3,83-392

Two small fragments of corn kernels.	
one seed of <u>Chenopodium</u> sp. or <u>Amaranthus</u> sp., that is goosefoot or pigweed.	
Unidentified carbonized material.	

Fea.40,L.4,83-395

Seed with pitted surface 1.1 X 1.5 mm, possibly nightshade, ( <u>Solanum americanum</u> ) This is not a positive identification.	
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## PAMMEL CREEK SITE (47 LC 61) CARBONIZED (Continued)

7.

Fea.40, L.6,83-399

Two small pieces of corn cupules and one of a small kernel,  
a fourth fragment is probably a part of corn cob. All are  
very heavily charred less than 0.01 gr.

Fea.40, L.7,83-402

One 8-rowed cupule, closed, width 6.0 mm. and three broken  
cupules 0.03  
Unidentified carbonized fragments less than 0.01

Fea.40, L.8,83-405

Three small pieces of small broken cupules less than 0.01

Fea.41, L.1,83-409

Heavily carbonized pieces of nut shell, probably hickory 0.04

Fea.41, L.2,83-412

One very small broken cupule, probably from an ear tip and  
a smaller piece of corn cob less than 0.01

Fea.41, L.2,83-411

Five small pieces of corn kernel 0.04

Fea.41, L.2,83-419

Four pieces of corn kernel 0.10  
Two unidentified, carbonized seeds.  
Three uncarbonized seeds.

Fea.45, Profile,83-444

Two small pieces of black walnut shell 0.02  
One seed goosefoot (*Chenopodium* sp.) 0.03  
Unidentified, carbonized material  
Uncarbonized seeds.

Fea.46, L.2,83-448

Unidentified, heavily carbonized fragments, some may be  
parts of corn cobs less than 0.01  
Uncarbonized, modern seeds.

Fea.49, L.1,83-464

One 10-rowed, open cupule, 6.0 mm. wide plus one broken  
cupule, one piece of cupule and two broken kernels 0.08  
and fragments  
Seven small pieces of unidentified material as in Fea.2, L.6  
and unidentified seeds and fragments.

Fea.49, L.2,83-468

Very small pieces of corn kernels and cob less than 0.01  
Two carbonized seeds of goosefoot (*Chenopodium* sp.)  
One small, unidentified, carbonized seed approximately 0.4x1.1 mm.  
One small pebble and uncarbonized, modern seeds.

## PAMMEL CREEK SITE (47 LC 61) CARBONIZED (Continued)

8.

Fea.49,L.3,83-471

Small fragments of corn kernels and cob parts

0.04 gr.

One seed bullrush (*Scirpus* sp).

One unidentified seed 0.4 X 1.1 mm and unidentified broken seed.

Uncarbonized seeds.

Fea.77,L.2,83-477Five small pieces of corn cob or stalk fragments less than  
Uncarbonized seeds and small non-botanical mineralized spheres.

0.01

Fea.77,L.4,83-480

One unidentified broken seed, possibly carbonized.

Three uncarbonized, modern seeds.

Fea.77,L.5,83-482

No seeds

Fea.77,L.6,83-484

One small, uncarbonized seed.

APPENDIX E  
MITAGATION PLAN



Proposal for Modification of Agreement  
"Archaeological Testing at Site 47Lc61"

Archaeological excavations are currently underway to test and mitigate the Pammel Creek Site, 47Lc61 near La Crosse, Wisconsin. Phase I testing conducted in 1981 produced only a light artifact scatter over an area of some 5,000 to 6,000 sq. mi., and one midden area. Extensive trenching and stripping of the project area has uncovered a large (approx. 3,000 sq. m.) Oneota village in the western half. The excavations have identified 80 features. As of June 1, 1983, 50 of these had been tested and 16 wholly or partially excavated.

The features seem to fall into three types: large storage pits up to one meter deep with abundant cultural materials; shallow pits and basins with little cultural material except fire-cracked rock; and irregular shaped middens of up to one meter deep with varying densities of cultural remains. These features may be house floors, possibly pit-houses. Excavations to date have yielded large amounts of artifacts especially faunal and floral remains. Large quantities of fish bones and scales, fresh water mussels; small mammal and bird bones, large mammal bones; and corn, beans, and other plant remains have been recovered from the features in a rare state of preservation.

The current excavations include an area of 225 sq. m. which has been stripped with a backhoe. Based on the density of the features in this unit we predict that the site contains a minimum of 385 features. The feature density in the 10 backhoe

trenches excavated across the site which have exposed approximately 340 meters confirm this prediction. The current excavations will test about 80 of these features leaving about 300.

On the basis of the current excavations and the present state of Oneota research, the following research questions concerning the Pammel Creek Site have been drawn up:

#### I. Settlement plan

a. Are there house structures present? If so, what is the size and arrangement of these houses? What is the process of their construction? Large dark stains in areas of dense feature concentration identified in the current excavations may be house floors. The fact that some of these stains are quite deep suggests the possibility that pit-houses may be present.

b. How many houses are there and what was the population of the village? How is the settlement organized? Are there activity areas? What different kinds of features are there and what different functions do they have? What internal patterns within the village are associated with different kinds of features? Are there burial areas within the village or were all the burials placed in the recently destroyed cemetery adjacent to the site? Does the site have a palisade such as at the Valley View Site?

#### II. Culture history

a. Is the site the result of a single or multiple Oneota occupation? Was the occupation(s) of the site for a long or short period of time?

b. What is the age of the site and, if present, the different occupations?

### III. Subsistence

a. What kind of economic activities and procurement patterns were used at the site? What kinds of agriculture were practiced?

b. Site catchment analysis. What are the sources of food energy at the site? Is procurement limited to riverine zones? What are the micro-procurement patterns? What areas and strategies were being used? What is the relative role of agriculture vs. hunting and gathering?

c. What is the source of raw materials from the site?

d. What season or seasons of the year was the site occupied?

e. What is the role of trade? What resources were procured outside of the normal catchment zone? Why is there such an abundance of bison scapulae at this site? Does this reflect different subsistence activities or other economic pursuits such as trade?

### IV. External relations and patterning

a. How does the site relate to the nearby Overhead Site? Possible house patterns were reported from the first excavations at Overhead by James Stoltman. However, the patterns were not conclusive and could not be verified by later excavations conducted by James Gallagher due to destruction of the site. How does subsistence differ from Overhead? What do differences in feature type and content between Pammel Creek and Overhead mean? Are Pammel Creek and Overhead contemporary?

b. How does the Pammel Creek Site compare to other

excavated sites near La Crosse, especially the Valley View and Sand Lake Sites? These sites are both located away from the main channel of the Mississippi. Do they show different subsistence patterns when compared to Pammel Creek?

c. Do diagnostic artifacts show links to other Oneota sites or Phases in the region?

This site offers an unparalleled opportunity to answer these questions and many of the problems of Oneota culture in this region. This is due to several factors:

1. The site is apparently not mixed with either earlier prehistoric materials or historic materials. Only Oneota artifacts are present. Many of the localities at Overhead and almost all of the Jim Braun Site were mixed with Woodland materials.
2. The site has not been heavily disturbed or stripped such as the case at most Oneota sites in the area. The main Oneota component at Overhead had almost two feet stripped off of it before Stoltman's weekend excavation. It was then plowed a number of times before the UW-L excavations. Both, Valley View Site and Jim Braun Site, had been stripped to an unknown depth before being reported.
3. The La Crosse River Valley may be a cultural boundary for Oneota sites in the La Crosse area. Some diagnostic artifacts (Blue Earth style pottery for example), and certain raw materials show up on one side of the boundary and not the other. Pammel Creek is the only known undamaged site south of the La Crosse River. The site

should be most important in sorting out the differences between sites in the vicinity.

4. The absolutely unusual state of preservation at the site is one of its most important qualities. Even the "skin" on the outside of the river clam shell is still intact on some specimens. Plant remains and bone are preserved in extraordinary condition. The only site in the area with comparable preservation is the Valley View Site.

The approach to the research questions will be as follows:

The only way to answer the questions posed in Section I., Settlement Plan, is to completely strip the site with heavy machinery, shovel-skim the exposed surface and map and record all features, houses, stockade lines, etc. Sections II. and III. will require extensive excavation of features exposed. The procedure will be to cross-section each feature by excavating a 20 cm. wide trench across the middle of the feature. The trench will be excavated in 10 cm. levels, and all materials screened by layer in  $\frac{1}{4}$ " mesh. All features will have one wall drawn in profile. On the basis of internal stratigraphy and preservation of archaeological materials, some of these features will be chosen for further excavation. These feature will be excavated by natural stratigraphic levels. A minimum of two liters of matrix will be removed from each layer for flotation. All other matrix will be water-screened by natural level in stacked  $\frac{1}{4}$ ",  $\frac{1}{8}$ ", and  $\frac{1}{16}$ " screens. Except in unusual situations only one-half of a feature will be excavated. Based on our experience at the site and our research questions, it is estimated that 100 features should be partially excavated in this manner.

153  
BUDGET

A. Machine-scraping, shovel-skimming, and mapping. One week.

Turnpull rental, cost includes excavation, backfilling, and re-seeding as required by the City of La Crosse. \$85/hr. x 35 hrs.	\$2,957
Principal Investigator @ \$16/hr. x 5 days	640
Fringe Benefits	165
Field Supervisor @ \$7.70/hr x 5 days	308
Fringe Benefits	99
Field Crew (10) @ \$4.45/hr x 5 days	1,780
Indirect costs @ 35% of salaries and Fringe Benefits	1,047
Travel, rental of university vehicles @ \$11/day	<u>55</u>
Sub total:	\$7,069

B. Testing of features. 6 weeks.

Principal Investigator @16/hr x 30 days x .50 (one-half time)	1,920
Fringe Benefits	495
Field Supervisor @ \$7.70/hr x 30 days	1,848
Fringe Benefits	598
Field Crew (10) @ \$4.45/hr x 30 days	10,680
Indirect costs @ 35% of salaries and wages	5,439
Travel @ \$11/day x 30 days	<u>330</u>
Sub total:	\$21,310

C. Excavation of selected features. 4 weeks.

Principal Investigator @ \$16/hr x 20 days x .50 (half time position)	1,280
Fringe Benefits	330
Field Supervisor @ \$8.16/hr* x 20 days	1,306
Fringe Benefits	423
Field Crew (10) @ \$4.45/hr x 20 days	7,120
Indirect costs @ 35% of salaries and wages	3,661
Travel @ \$11/day x 20 days	<u>220</u>
Sub total:	\$14,340

D. Field laboratory, artifact processing, cataloging,  
and preliminary sorting. Seven weeks.\*\*

\* Increase due to state mandated cost of living increase.

\*\* Field laboratory will run on a 12-week basis, but 5 weeks are paid for  
under the existing contract.

## D. (continued)

Laboratory supervisor @ \$4.75/hr. x 7 weeks	1,356
Materials analysis identification and classification of lithic and ceramic artifacts, and bone tools. \$6.50/hr x 7 weeks	1,820
Fringe Benefits	308
Laboratory assistants (5) @ \$3.75 x 20 x 7 weeks	2,625
Indirect costs	<u>2,138</u>
Sub total:	\$8,247

## E. Analysis and report preparation

Principal Investigator @ \$16/hr x 12 weeks x .15 (15% position)	1,152
Fringe Benefits	297
Laboratory and analysis director @8.16/hr. x 12 weeks	3,916
Fringe Benefits	1,269
Materials analyst @ \$6.50/hr x 15 days	3,120
Fringe Benefits	527
Secretary @ \$6.50/hr x 15 days	780
Fringe Benefits	253
Laboratory assistants (4) @ \$3.35/hr x 20 hrs/wk x 12 weeks	3,126
Indirect costs	5,054
Consultants:	
Faunal analyst	1,920
Floral analyst	1,500
Geomorphologist/sedimentologist	650
C-14 dates, @ 5/\$1000 at UW-Madison	1,000
Report reproduction, 2166 pages @ .03/page	65
Photographic processing and reproduction	35
Artifact and map drafting	<u>185</u>
Sub total:	\$24,849
Grand total:	\$75.815

APPENDIX F  
FIELD NOTES



LC 61 - Personal Creek  
 Features - possible does located during  
 backhoes + shovel excavations

Trench #	# of Features	Length of Trench
A	3	15m
B	3	20m
C	4	30m
D	6	100m
E - SEE AREA A		
F	9	50m
G	8	60m
H	10	65m
I	3	70m
J	4	75m
#		150

Area A - 15 x 15 m block between 45-60, E-S-20  
 50-70m 2 strips = 16 Features  
 3rd strip from 72-8 Features  
 4th strip from 8-14 Features

Total Features

# includes Trench E extension to west property line ca 15 m. w of O.E.

List of Features

Feature #	Feature Name	Notes	Check
1	Trench A Fea 1	Ball	✓
2	Trench A Fea 2-A	Ross	✓
3	Trench A Fea 2-B	Ross	✓
4	Trench B Fea 1	Ross	✓
5	Trench B Fea 2	Ed	✓
6	Trench C Fea 1	Ross	✓
7	Trench C Fea 2	Course	✓
8	Trench C Fea 3	Ross	✓
9	Trench C Fea 4	Ed	✓
10	Trench F Fea 1	Ross	✓
11	Trench F Fea 2	Ross	✓
12	Trench F Fea 3	K-T	✓
13	Trench F Fea 4	Ed	✓
14	Area A Fea 1	Ed	✓
15	" " " 2	Ed	✓
16	" " " 3	Ed	✓
17	" " " 4	Ed	✓
18	" " " 5	Ed	✓
19	" " " 6	Ed	✓
20	" " " 7	Ed	✓
21	" " " 8	Ed	✓
22	" " " 9	Ed	✓
23	" " " 10	Ed	✓
24	" " " 11	Ed	✓
25	" " " 12	Ed	✓
26	" " " 13	Ed	✓
27	" " " 14	Ed	✓
28	" " " 15	Ed	✓
29	" " " 16	Ed	✓
30	" " " 17	Ed	✓
31	" " " 18	Ed	✓
32	" " " 19	Ed	✓
33	" " " 20	Ed	✓



Pinnal Creek LC 61  
 5/10/73  
 up from Wisconsin 70 ft  
 up  
 Varies shore line range from  
 1970 survey - Estimated location  
 of feature 1. P. 1st Area of  
 100 ft diameter soil core. 10 ft  
 above 1st probe holes soil  
 in all homogeneous blocks  
 of fine sandy loam  
 in some very fine  
 west end where P. 1st field  
 and light sandy terrace  
 and the wind flights subdivided  
 for 1 hole very close to  
 where Fin 1 should be with  
 Fept at the same. This  
 is essential location  
 for the strapping  
 Soil - Gravelly  
 base line along west edge  
 of field in shaded  
 area. 1972 survey  
 100 ft. P. 1st in strapping  
 is in a slightly beginning  
 in one of areas SW corner  
 of field. Actually on edge  
 of 25 ft at west edge  
 of field - 100 ft  
 F. 1st located 100 ft  
 15 60 N  
 U



Big. T-1 2  
 N 51 E 1 = NE cond. 1  
 of 1 x 1  
 This is near Fall grade  
 hole  
 L-1 soil not screened  
 L-2 = lot 4 - screened in low fl. L-1  
 L-3 = lot 5 -  
 Plow zone regraded to 22 cm  
 by increased cut, foot density  
 B-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.



side will now be preserved and no further investigation is necessary.

Future plans may use some high school to adult Fish schools.

We do some more excavations such as tracking the possible direction which we did not get to look at and open some controlled spaces to better understand nature of Arizona middle.

Trinch A-Fin 1 Gill Greys  
Exposed undisturbed materials in  
FCB channel, shell temp. 10-15°C  
at Fall + Summer - more "High school"  
+ FCB - Soil Samples collected.

Feature appears like pit in NW wall  
of Backhoe Trinch - Bare core.  
under large FCB. Depth of Fin  
Base = 40 cm ± line level 1

line level for Trinch A is  
10 cm above surface at we end!

Trinch A Fin 2  
level 1 30-40 cm  
at 40 cm edge of Fin on we  
end visible. N 3/4 of Black  
between 9.0-10.6 m E of Q.

Trinch A  
Fin 2 - Level 2  
10-50 - 5/12/67

Trinch A - Fin 2 1-3 50 to 60 cm  
Photographed of FCB, shell  
at we edge - Reddish w/ much  
Fish bone + shell - Fin 2-B  
most of E 2/3 dark w/ charcoal  
FCB some bone, plates = Fin 2-A





Trutch A Feb 2-A Took off duck. Fan  
 L-7 took Ash, but Ash lay  
 did not continue to east edge of  
 edge of pit. Along stream  
 Edge of pit duck fill continues  
 down and may return to under like  
 Ash to west again. 47.85 cm  
 stopped digging hole.  
 L-8 will be natural 1-year of  
 Ash. All will be nesting.  
 Pit balls along E wall at  
 55 cm deep (beginning).  
 Turtle shell + bone too.  
 5/2/83  
 R-8s will 1.66 level 9  
 below Ash 94-104 cm values  
 natural soil layer with this  
 Got only 1/2 layer in afternoon  
 so need to finish L-9 tomorrow  
 L-9 top 5 had another turtle  
 in it + fish scales + bones  
 bones split animal long bones  
 Fish, charcoal, couple of flakes  
 5/23/83 - Depths of levels  
 does not match up with as-  
 measured depth this morning at  
 to 1/2 Trutch 9 and 1/2 at 85 cm  
 L-9 should be 80-90 cm and  
 we are treating it this way from  
 now on.

5/24 - Feb 2 of site Family 2-A Feb 2-A  
 This pit will not have a good  
 profile. The backhoe Trutch  
 A has cut over the top of it  
 leaves only a small ridge in profile  
 in upper levels. ~~Recessed~~ it  
 appeared that we would have  
 a good profile in S. Th. will

Truck B	line land at 300	500
1500 -	E	
AT ca 300	cl. of Pin. 7-12	
at base of RZ	Pin. 12-14	
Backhoe		
Dark soil	int. into 1524	
Sub soil	5.80	E - probable
Dark mud-like	isolated at end	
of Pin. 12-14	(2,30 E, 14, 14W)	
depth - 45	below	in line
Fin 1	dis. towards	E and
See Fin	from	
Fin	coastal	of shallow
below	at A - zone	sh. 12
F.C.P. Handle		
Fin	grass into	N.W. 11 of
Truck		
5/18/83 - overnight	dist. -	
F.C. showing	from	N.W. 11
of Fin 1 (Truck B)	was	
Grass	at	line 15 x 20 m
hole in	Pin. 12	
Returned to	Fin 1 - cut	Pin. 12
from top of	soil	area to
N. 15	line	0.1 m not seen
Plan Zone	cut	N.W. 11 Pin. 12
back to	extent	of gurgling
ca 15 cm	to N.	

5/16/83  
Trench B Fun 2  
chert on 5m B  
w/ void in through  
shell + rim shell.  
Pneumonia + depth on Fun  
P. 6. 2. 3 N. 1/2  
In profile - shallow basin  
shaped - 1/2 to 1/3 of chert  
No ortho. Bedrock on  
to N. T. 1/2 out 1/2 in  
matrix. H.S. shell + pitting in

5/16/83  
Trench B Fun 1  
chert on 5m B  
w/ void in through  
shell + rim shell.  
Pneumonia + depth on Fun  
P. 6. 2. 3 N. 1/2  
In profile - shallow basin  
shaped - 1/2 to 1/3 of chert  
No ortho. Bedrock on  
to N. T. 1/2 out 1/2 in  
matrix. H.S. shell + pitting in

Trench C

Re-exposed - exposing base of  
Core at Fish Bay  
near W end. Could not find  
Core of WH Trench

Assigned Fan #s to strata  
which have exposed stratified  
placed flags on S side  
of Trench to relocate  
then covered

Fish = Trench C Fan 1

Dark stain ca 7 E w/  
RCC + Green stain = Fan 2

Stain into S wall w/ 1 FCR  
at ca 10 E = Fan 3

5/18/83 - while exposing core section  
of fish hole in C end found  
unexposed Fan 3. This Fan is  
historic - it's no further back.  
Jim said while backhoeing  
strata down low in plastic bag  
found immediately above here

Trench 5/11/83

Doubt skin of 1st skull of 1st

on 2nd F

5/11/83  
 Lumen at Fm 4 (Trench C)  
 on 30 N 3E  
 exposure L-1 = open 1st 33-43 (Ls)  
 L-1 mammal look Fld. Bifurc tip  
 Fish been (possibly in trench)  
 such as Trench C Fm 1 (2)  
 good Fm w/ large mammal  
 etc in concentration  
 exposed and photoed -  
 did not find 3rd level 1.

5/14/83

Grise +  
Trick K 1992  
30N ca 10E

Not much of a  
Fish here FCA

Some shells + some  
mammal (P) soil + charcoal  
but not much soil

small "concentration" of  
used No. 100 distillate still  
for outflow at base

low level 1 (100m high) soil

No water is light brown -  
red but no dark is dark

at surface

5cm into level 2 in surrounding  
predistilled soil, base of A-20s

big no. of shells in w. 1/2 ft  
still dark, Artificial "conc" at

W. 1/2 ft dark soil  
Art. levels continue to 11 ft

large Fish loc. - Difficult to see from edge

due to surrounding dark soil

needed to profile from w. 1/2 ft  
ca. 20 cm wide or w. side of sea.

about 500m down - began to  
reach ash soil, Ash exposed

as go down - Ash's dark  
even - out of Ash's dark

but ~~the~~ fine artificial ash  
overlying 10-2 m soil

Ash directly beneath artifacts  
in levels 1 & 2  
5/23 Trench line mini trench base  
of 4-2 appear to have stain  
edges of 5-11 5-12 Ash does not  
most of Ash. Ash does not  
center to edge  
Removal Ash in Van Riche  
from center and put in matrix  
chamber 4 DCR line - thin  
dark soil.

5/24  
George Trenching 25 Feb 2 of  
Trench C~~2~~ which is now side  
Feature 7. AT top of 4-2  
had fair definition of feature -  
By 4-3 very clear as dark  
circle a very wide. Ash does  
not 4-2 2003 soil Blue Earth Rim  
w/ loose handle.

6-1 in digging Trench C Feb 4  
now side Feb 9. AT 4-7  
(103 cm) B got bottom  
Niche below Ash layers found  
in upper levels

Trench F

cluster of meadows at end  
of Trench F

State of the lake water

5/20/83 - Pot 2 will dig

in Trench F, then to define

Free edge. Found 1 pocket of

artifacts (pins, etc., FCR

in SW corner of Trench

concentration.

4 Biscan Sepulchres found

any of 1 on the other and

orientations are in same

direction (Vest) at ca 5m.

Trench not much

else just w/ Sepulchres

level 1 out.

Because Foul looks TB + is so close to

Foul 4 will add extra trench along

small from Foul 4 to west

of Backhoe Trench. Foul 4 is

at these Foul are still separate

or 1-2m middle. Sketch of

find wedge of Foul 4 in this

mini Trench. To find edge of

Foul 3 will dig mini trench along

west of Backhoe Trench. F see

Sketch of

E

Trench E

Thurs May 27

Pot 2 Trench 1 Foul 4

Tues June 1

Pot 2 Trench 1 Foul 4

58-59.2 m, 55-2 m W.

Foul 4-6 Ash Shovel

W end, About 12m

L-1 Got buried soil w/ lots of

chert + buried wood +

a few pot shards in E

FCR shows a cut to

W

L-2 Ash below buried soil in

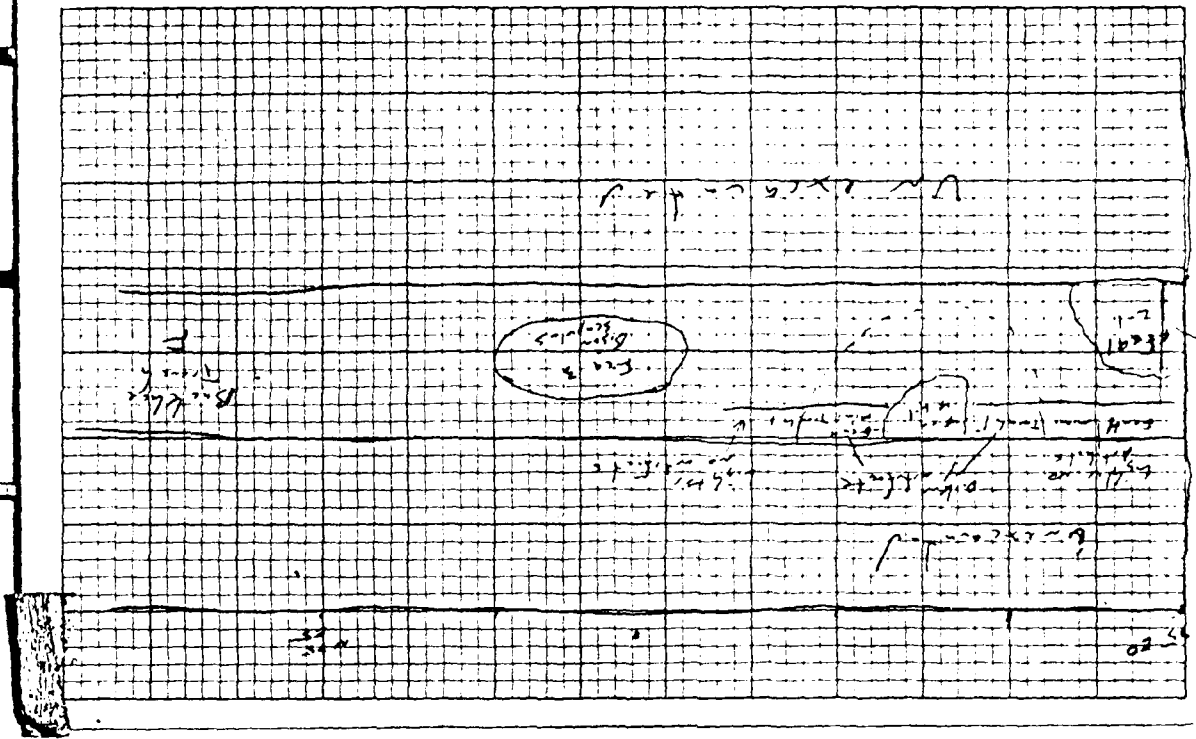
E end. Still in center

L-1 took notes from

Ash in W end + buried

in E end.





5/22	Touch F	For	mini touch
	2-1 100m	For	white to do
	fan	stair	will go 10 more on
	as	2-2	to see if we can
	get	was	1,561 sub suit.

Flora

1 can  
Kupar will be  
Exposed in  
Scapulae in  
in site 9 large  
Photograph + removed  
only in 1 can isolated  
at site 9  
shards, PCR 1 km - known  
destroyed by train

5/19/63

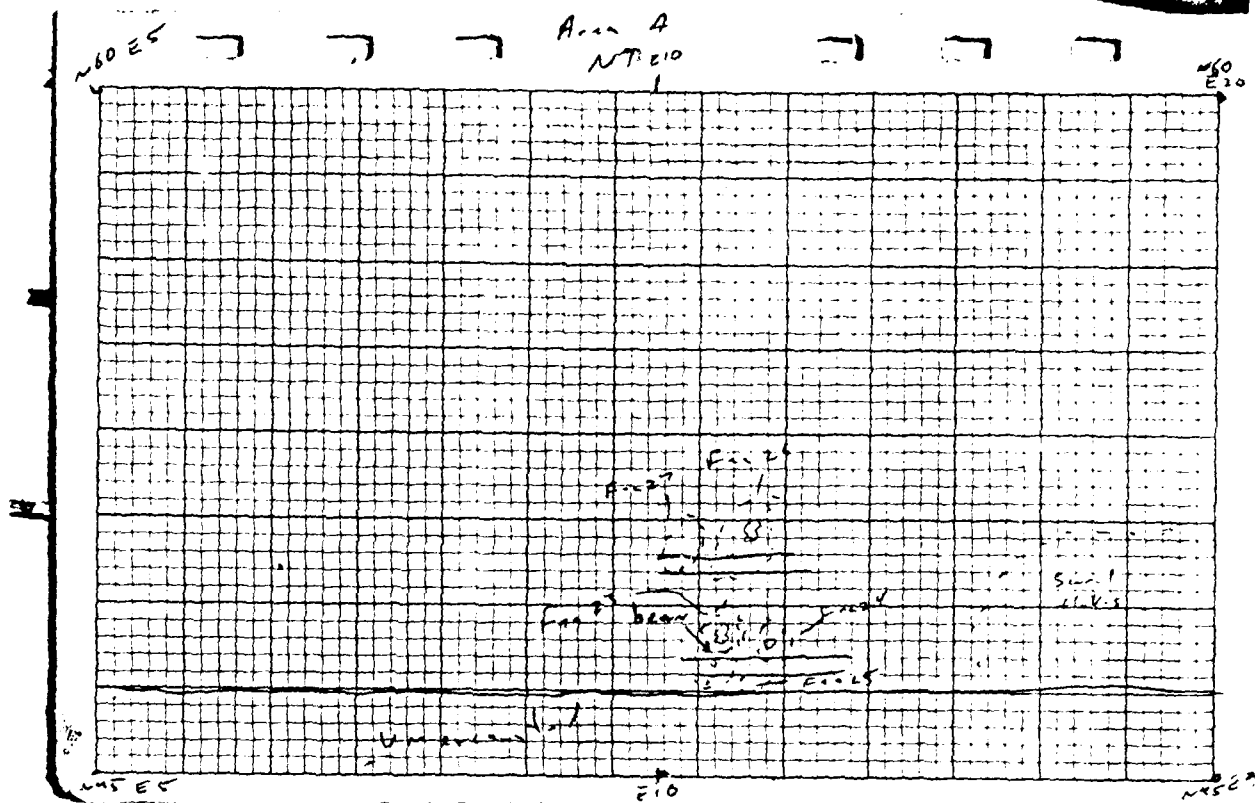
Ross at Trench F Feb 2  
75 ft ca 10 ft  
Ls of Pottery (a vessel?)  
Some flint, PCR, bone (F36)  
= 4-1 5 cm bone  
Removal artifacts  
may not be upper part  
R. The middle dump w/  
Feb 1 + 3 ???  
L-2 = 10 cm  
These mesoma 1 long bone  
+ skull at base of  
L-2  
L-3 10 cm  
Fing bone conc. 2 shells  
F36, nice dark circular  
chair indicates pit for

Trench F  
In Fin 4 mini trench  
found possible else of Fin 4  
to E of A. already excavated  
pit, built up with mud edge  
at base of mini trench skins  
as fairly distinct light vs dark  
soil colors. All artifacts in light  
will now remain below this edge  
following to dig rest of Fin 4  
level.

Trench G  
Isolated Loop Handle exposed by  
backhoe at ca 10m E

Trench F Fin 4  
ca 2m E cluster of naturally  
in N wall of ED digging level  
level 1 = 10 cm.  
Outward approx edge of Fin 4  
only discernible from cluster  
of artifacts, secondary soil  
very compact dark sandy loam  
but apparently from artifacts.  
But this Fin 4 is only ca 50 cm  
from Dig 1 and ca 40 cm  
to E on N wall is still  
suggesting possible middle.  
Fin 3 only ca 3 m away.  
Rebad ground Fin 4 found  
dark to go down ca 40 cm  
below top of L-1 base of  
backhoe trench) shown in photo.  
along N wall at 2 m E.  
Access to ~~the~~ ~~ground~~ ~~at~~  
Along S wall probed and  
got soil chipped to light  
sand at out 20 cm from  
L-1  
L-1  
Will dig mini trench along  
N wall to see if we  
can locate edge of Fin 4.  
mini trench called to Fin 4 Trench 1 going  
To eastward ca 20 cm wide. wall  
dig in 10 cm levels with back extended  
as far as artifacts go to eastward.  
see sketch back of notes for  
Trench D Fin 4

Then A - 15+1.0 m  
 around 1977 Fall  
 S/20/ Scoping basin -  
 several bags of flour 20-  
 mounds white chalky  
 clearing Area between W45-80  
 A 1 E 5-20.  
 Plot zone maintained by  
 front and back strips = ca 2 m wide  
 in E-W direction.  
 5/28/  
 Plot should be scopped and removed  
 floor at bottom most back 6-  
 strings of small possible flint located  
 and isolated artifacts - include  
 cluster of hand FCE soil charcoal  
 at ca N 47 E 0, FCE Plot should  
 be at ca N 46 E 11, charcoal  
 at ca N 48 E 2.  
 5/23 - will map in flagging - 1.1 m  
 at front.  
 Soil ditch and flag edges  
 hard to see - impossible  
 other than artifacts - 20 cm  
 wide trenches in E-W direction  
 possible features, 1 trench at N 46-20-  
 N 46-40 and E 11 - 2nd trench  
 Trench at N 47-80 - N 48 and E 10 -  
 Trench down in 10 cm trenches



Tracks in Area A -  
 Feb 24 - Fire + charcoal on surface  
 1 level 38-40 cm bs by Road  
 AT bottom soil 12-14" middle  
 In profile no indication of  
 pit from only area of charcoal  
 charcoal at very top. Abandoned.  
 uncertainties  
 Feas 24 + 25 - 67 mil. -  
 also 3 ft levels (35 cm) fine  
 soil of Machine striped surface.  
 Track indicated a possible feature  
 24 + 25 with an charcoal + PCR  
 at surface Extension to back  
 reached pit Feas - good possible  
 no small of pitting, Feas, still  
 35 cm is base. A zone confused  
 defining a upper 15 cm or so.  
 Profile mapped. Feas Feas 24 + 25  
 Colored Feas 24 - Feas 45 # 6 -  
 be abandoned.

Track 6. Inactive Feas 26 + 27  
 At zone makes Profile sufficient  
 to define Street 20 cm. AT ca  
 17 cm below surface of Machine  
 striping set Ash layer just below  
 pit very re-entrained. Pitting on layer  
 mainly reddish soil - lots of  
 fish bone. Ash contains burnt  
 unburned bone.

Trailing Fan #18 - Held  
Dark A Trax - Gas Defining  
Difficult for 200m AT 200m  
some dark stain visible

min. Trunk Fan 16  
shallow basin pit

5/24 - Resampled Fans 14+15  
found to be only isolated  
artifacts at top of Machine  
scrapped floor. These  
not cross sectioned.

Shipping Fees in 3d strip  
for south - & showing

5/24/

striped a most end of Acc-p  
this strip end 3rd from Sp end  
should appear - 9 possible Furs

5/5 - End - 2 skip

5/24 -	extended	T-16 E	To west
from	5 m E	To property	1.2 mi (= ca 10 m)

5/26	Jeff	crossed for 5501	227
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Expenditure	to	50 cm
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70	at edge of	fray looks
----	------------	------------

like a pit Area so fine

7-1	down	will	0-1	use
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Ex 26 and 27 minute #27

File 36	- the Re	- cultural	SV-100
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207	10-10-1968	11-10-1968
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My class did not exercise

5/26  
 Trenches at F-33, 31, 47  
 21-22 do not have clear  
 F-33, 31, 47  
 dark A-2 zone below  
 and probably represent a general  
 m. 1/2 in.

Cross sections at F-33, 31, 47  
 37, 35, 18+45, 28, 34 have  
 pits in profile. Pits may form  
 shallow basins in fairly deep basins.

5/31 continued Trenching F-33  
 Ed F-33 44 taking out  
 Bill Gross, et al. finishing F-33 44.  
 F-33 44 turned out to be shallow  
 chemical concentration.

F-33 44 at 55 cm below  
 sampled surface soil still dark  
 w/ no edges - artifacts still  
 coming

Depth of soil change 50 cm to  
 1 m to 50 cm + 1 m to 5 + 50 cm  
 to west side to 65 cm below  
 base of sampled surface AT  
 1 m only 55 cm below

Agencies - 3 Through A-2 Port  
 on large F-33 side shift, then



Staff continuing F-26  
T-14 extended trench  
to SWTR. Got to base of  
F in at base of L-5.  
50 x 25 cm extension to S was  
spaced last Tuesday to express  
what looked like a Bison  
S. got set turned out to be  
flat FCR. In black with  
to S. Got quite a few  
artifacts - in A-Zone ~~area~~  
part of L-5

Learned F-40 continues  
trench out several levels in AT  
base of L-3 should be able  
to dig F-40 L-1 & 2 level  
FCR + some other artifacts  
L-5 continues next week.  
To F-40 soil is 2 ft, semi  
dark in center.

[illegible]

6/1/83

potential problems for addition  
Striping? Davis initial stripings  
of B. 1000s + F. 1000s (T. 1000s A-2)  
and F. 1000s (A-2) identified  
potential features from Artificial  
concentrations below the plow zone  
Zonal stripings only removed plow zone  
which was semi distinct as  
slightly lighter than undisturbed  
A-2 zone beneath A-2 zone contains  
for 10-30 m to light brown  
B-2 zone lots of Reddish. Problem  
is that A-2 zone contains several  
village middens and several of  
the possible features when Trench  
Trench out not to be pit features  
interfusing into B-2 zone. These  
may be pit features which are  
not distinct in the A-2 zone but  
new pit features which represent  
concentrations of the village midden  
what to do for next phase of  
Striping? Do we strip plow zone  
again and some trenching  
pit features but middle concentrations  
or strip A-2 zone and get better  
but will define remnants of pits?  
Prob. striping A-2 zone only is  
dist. known more pit features  
might not show pit features  
Prob. of stripings All of A-2 zone  
That were destroyed lots of  
in situ remains.

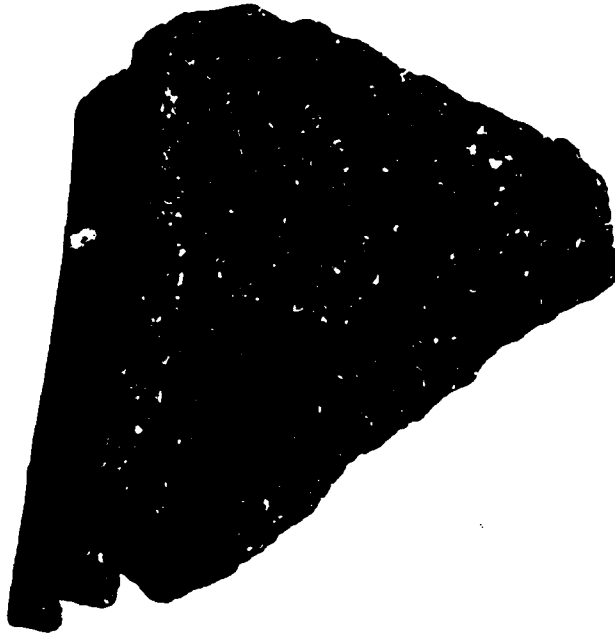
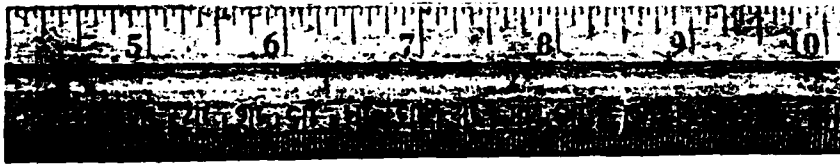
Ed. 1/1/84

Final section from  
upper reaches of A-2 zone  
at depth of ca 58 cm below  
second surface. A-2 zone  
(see undisturbed A-2 zone  
H. 1000 lot of charcoal + sherd +  
shell in lower levels shows  
as fine and brownish  
pottable trench covered  
and part of F. 1000 to N. lot  
is not for trenching to get  
good edge in pit.  
Rise out of 46' very deep pit  
from A-2 zone fill below  
base of surrounding A-2 zone  
but ditch layer up sherd +  
T. 1000 on bottom. Pottery  
shows suggestions of bellis  
Pottery does not show it  
F. 1000 originating in A-2 zone  
but F. 1000 on top of pit  
at base of P 2 is  
with A-2 zone suggesting it  
is originating in A-2 zone. Unfortunately  
that F. 1000 fill + A-2 zone are  
virtually indistinguishable.  
Lulu at #40. Also going very  
deep. Soil extremely dark as  
fine interbedding to B-2 zone  
but fine artifacts

Heil: Finished Feb 92. Trends  
 In top layer This Feb had  
 shell concentration + lots of charcoal.  
 heavy B is thin bed pt reddish  
 soil, very little below Feb  
 dips slightly w/ milled A-2  
 but This may not be representative  
 a pit was there it might be deeper  
 A-2 from more organic  
 A-2 that conc. in middle  
 in A-Zone above.  
 Thomas at F-19. Trench  
 L-1 some artifacts + charcoal.  
 L-2 little in middle of A-2  
 No different - 1 staining do  
 indicate pit Feb. will take  
 L-3 to be sure  
 Heil at F-43. Small  
 conc of charcoal at surface  
 below A-2. Taking material  
 from core.  
 Jeff at Feb 23 + 24. is extending  
 Trench for F 24 + 25. This was  
 dip by mile - (Area A mini trench 1).  
 Feb 23 to N to get profile  
 of F-23 which shows as thin  
 + artifacts, but at surface  
 Feb 24 from earlier excavation  
 extended into this excavation. This  
 separates w (F-23) from E (F-24)  
 hill in profile at F-24.



APPENDIX G



Oneota (Blue Earth like) rim sherd from Sherwood Heights subdivision (terrace) overlooking Pammel Creek Site from the south. Jack Grimes Collection.